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## SURGERY

Edited by S. S. Peikoff, M.D.

### Visceral Denervation in the Control of Functional Abdominal Pain, Biliary Dyskinesia, Chronic Pancreatitis, Intractable Abdominal Pain of Organic Origin and the Pain Due to Adhesion Causalgia

Richard O. Burrell, M.D., L.M.C.C., Ch.M., F.R.C.S. (Edin.), F.R.C.S.(C)

It is generally accepted that the vagus nerves, while they may possess afferent fibres, do not convey pain sensation from the abdominal viscera. (Cannon, Am. J. of Physiology, 105:366, 1933). The ablation of ulcer pain after vagotomy is due to the diminished acid values. Dragsted states that the pain can be reproduced in a vagotomized individual by instilling 200 c.c. of .5% hydrochloric acid into the stomach. This has been verified personally a number of times using lower concentrations of acid. The sympathetic nervous system is the sole pathway of unpleasant and painful stimuli originating in all the abdominal viscera with the exception of urinary bladder. F. H. Bentley of Newcastle, in the Annals of Surgery, November, 1948, by a series of clever clinical experiments was able to show that the tenderness of active duodenal ulcer can be abolished by splanchnic block only. Ray and Neil of Cornell, in Annals of Surgery, November, 1947, prove that pain sensitivity from the alimentary tract and kidney is mediated solely by sympathetic pathways. Their experiments tended to show that, with the exception of the stomach, right and left colon and kidneys and ureters, the abdominal viscera have a bilateral sensory mechanism. In actual practice, and particularly in functional pain, this last observation is not borne out; nor is it accepted by Smithwick, Jones, Mallet-Guy or Leriche and Fontaine.

This knowledge of the pain relieving potentialities of sympathetic denervation has not been used extensively in the control of abdominal pain. Mallet-Guy, de Takats, Leriche, Marion, Fontaine and others have reported small, but generally successful, series of splanchnic nerve section for the control of pain in pancreatitis and carcinoma of the pancreas. Smithwick and White, in the second edition of their text, report the use of alcohol block or the removal of the necessary sympathetic ganglia in two cases of abscure abdominal pain and in one case of pancreatitis. Marion, Lyon Chir., 1945, 40:315, reported the successful treatment of seven out of nine cases of acute pancreatitis by splanchnic infiltration.

The sympathetic supply for the abdominal viscera has its outflow from the cord from T3, 4, or 5 to L1 or 2 approximately. There are possible fibres from above this level entering the coeliac ganglia by way of the phrenic nerves (Hovelacque). The segmental supply of the abdominal wall is from T7 to L1. The sympathetic cell station for the stomach, duodenum, pancreas, bileducts and liver is the coeliac ganglion. For the kidney it is the aortico-renal ganglion, and for the small intestine, and likely the right colon, it is the superior mesenteric ganglion. These last two viz., the aortico-renal and superior mesenteric ganglia are too poorly defined anatomically to lend themselves to selective surgical attack. With the exception of the uterus (hypogastric plexus) and the ovaries and tubes (sympathetic fibres in the infundibulopelvic ligament), the exact distribution of sympathetic fibres to the remainder of the abdominal viscera is not so arranged as to lend itself to isolated resection.

The choice as to whether a coeliac ganglionectomy alone or a combined thoraco-lumbar ganglionectomy with splanchnicectomy and coeliac ganglionectomy is done depends upon many factors, the main one being the site of origin of the pain. The great advantage of coeliac ganglionectomy is that it can be done through the incision used for abdominal exploration. The incision I routinely use for thorough upper abdominal exploration is an inverted V or Double Kocher which lends itself admirably to the exposure of either coeliac ganglion. The conditions for which I have used, or would use, coeliac ganglionectomy are:

(1) Chronic recurrent pancreatitis.
(2) Carcinoma of the pancreas.
(3) Proven biliary dyskinesia.
(4) Gastric crises.
(5) Upper abdominal pain of no proven aetiology which, in the light of our present inadequate knowledge, we call **functional** pain.

Let us take each of these proposed indications for individual consideration.

Chronic relapsing pancreatitis is a clinical entity with which we are becoming increasingly familiar Its aetiology is unknown but it has been suggested that ischaemia may be a factor. Acute pancreatitis can be produced experimentally by splanchnic

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Chronic relapsing pancreatitis is a clinical entity with which we are becoming increasingly familiar Its aetiology is unknown but it has been suggested that ischaemia may be a factor. Acute pancreatitis can be produced experimentally by splanchnic

stimulation (Reilly quoted by Mallet-Guy). In the past there have been three courses open to the surgeon: do nothing, remove the gall bladder and drain the common duct, or remove the pancreas. The first course is of no value, the second is ineffectual and the third is unnecessarily dangerous. Coeliac ganglionectomy will relieve the pain—see personal cases. According to Mallet-Guy, Lyon Chir., 1945, 40:293, sympathectomy not only relieves the pain but cures the pancreatitis. He reports eleven cases with unilateral splanchnicectomy. Fontaine and Forster, Lyon Chir., 1946, 41:279. report bilateral splanchnicectomy in one case of pancreatitis with a cure. Geza de Takats personally informed me that he has six cases of splanchnicectomy for pancreatitis which he is preparing for publication and that Mallet-Guy will soon publish over ninety cases in an American journal.

Carcinoma of the pancreas can be extremely painful. I suggest that when this lesion is found, during exploration, to be the cause of upper abdominal pain, there is no justification for not removing the coeliac ganglia or ganglion on the involved side. If it appears later that, because of extension of growth, etc., the relief of pain is incomplete, more extensive surgery can be done in the form of thoraco-lumbar ganglionectomy and splanchnicectomy.

Biliary dyskinesia can only be proven by thorough exploration of the common duct and head of the pancreas. If this classical functional disorder is determined, by exclusion, to be the origin of the fairly typical symptoms, treatment can be applied. Some authors feel that instrumental dilatation of the sphincter of Oddi or sphincterotomy may too easily result in fibrosis and stricture. It has been demonstrated that the dangers of ascending cholangitis following choledocho-duodenostomy are too grave to suggest that this operation be done for such a benign lesion. I feel that the risk of failure is too great to subscribe to the belief that, by stripping the common duct, I can incidentally divide the sympathetic fibres destined for the ampulla of Vater and sphincter of Oddi. (These sympathetic twigs should reach the sphincter by accompanying the right gastric, gastro-duodenal and superior pancreatico-duodenal arteries). I know that the certain way to denervate and relax permanently a functionally spastic sphincter of Oddi is to remove the right coeliac ganglion. Mallet-Guy, Jeanjean and Servettaz, on the other hand, have found that splanchnicectomy occasionally results in biliary hypertonia which, of course, is painless.

In the gastric crises of tabes a coeliac ganglionectomy might prove inadequate. I have never done the operation for this purpose. More extensive sympathetic denervation has been shown to relieve the pain. Fontaine and Forster, Lyon Chir., 1946, 41:279, report two cases, one of which was successful. However, if nothing is found on exploration to account for the pain in a patient with a presumptive diagnosis of gastric crisis, I feel that bilateral coeliac ganglionectomy is not only justified but indicated.

The determination that abdominal pain is functional and not organic depends upon a negative abdominal exploration conducted with thoroughness and knowledge. The separation of functional pain from organic pain in a neurotic or hysterical patient is something surgeons do not usually attempt. It is too easy, after negative physical findings and laboratory and X-ray investigation, and particularly after negative exploration, to attribute abdominal pains to neurosis. I believe we should attempt to distinguish between functional pain and neurotic symptoms. Neurotics are characterized by the multiplicity and bizarre nature of their complaints and by the way they make them known and even by the very words they use in describing their imaginary troubles. These are general features which every doctor recognizes. Neurotic symptoms are presumed to be psychogenic in origin. On the other hand, there are many diseases which, because of their regular pattern of symptoms, we have named, but, because we have been unable to demonstrate an underlying and undoubted pathology, we refer to them as being functional. Migraine, various achalasias and dyskinesias, tic douloureux, Raynaud's disease, acrocyanosis and causalgias, are examples. Most would seem to have a neurovascular basis. There are some patients with abdominal pain who have no neurotic characteristics and in whom the pain and other symptoms are syndrome-like in their regular and unvarying nature. They have been investigated repeatedly and have often been subjected to one or more explorations. If one is impressed with the non-neurotic attitude of the patient and the non-neurotic nature of his or her complaints, I suggest that the pain may have a functional basis and be amenable to relief by sympathetic denervation. It is idle to speculate as to the nature of functional pains. They may be ischaemic, dyskinetic, or spastic. They are local disorders of function and are not psychogenic and can be cured surgically. They are not particularly common. The two cases of obscure abdominal pain reported by Smithwick probably fall in this functional group. Since abdominal exploration is often necessary to rule out organic disease, I suggest that, for pains of this nature in the upper abdomen, coeliac ganglionectomy be done.

Why do I suggest removal of the coeliac ganglia instead of abdominal division of the splanchnic nerves? While it is simple enough to recognize the greater splanchnic nerves through an ab-

dominal incision, it is usually impossible to identify and divide the lesser and least splanchnics. Furthermore, it is not determined what part any possible outflow from the first and second lumbar segments to the coeliac plexus play in the innervation of the upper abdominal viscera. Nor is it possible to divide any sympathetic filaments to the coeliac ganglia which may arrive by way of the phrenic nerves. Any sympathectomy done for pain must be complete. While coeliac ganglionectomy cannot insure completeness, there is no other more thorough method of denervating the upper abdominal viscera through an abdominal incision. The fact that coeliac ganglionectomy is a post-ganglionic sympathectomy seems to have no clinical importance.

Mainly because of their location, some abdominal pains of non-organic nature and some pains of organic origin and intractable course do not lend themselves to relief by coeliac ganglionectomy. Such unfavourably located and widespread pains will be illustrated later in case reports. If sympathetic denervation is eventually thought to be indicated, I submit that, in these cases, it can be done thoroughly only by a combined thoraco-lumbar ganglionectomy from T6 to L2, splanchnicectomy and coeliac ganglionectomy. If coeliac ganglionectomy is omitted the phrenic filaments will be missed. If thoraco-lumbar ganglionectomy is omitted, the aortic plexus will be missed as may the aortico-renal ganglion supply. This combined operation adds nothing to the morbidity of splanchnicectomy alone. For this operation and for the treatment of hypertension, I employ the Hinton modification of Goetz' approach, going extra-pleurally through the bed of the tenth rib and splitting the diaphragm ventrally from the crus. This approach is rapid, relatively bloodless and gives wide exposure. It seems to be far superior to the Smithwick technique of lumbar incision with resection of the twelfth rib. The operation often can be completed in one hour.

There is a special group of patients for whom this more extensive type of denervation is applicable. I refer to what I like to think of as the causalgia of visceral adhesions. Though it is not common, I am convinced that such a pain mechanism does exist. Usually, of course, adhesions produce no symptoms at all or result in obstructive phenomena. We are all aware of the futility of abdominal operations to cure the pain of adhesions, so this concept of adhesion causalgia may open a whole new field of speculation. It may point, for instance, to the proper treatment of the painful violin-string adhesions between the liver and diaphragm which result from previous subphrenitis and which so closely simulate biliary pain. It may also explain a few of the fixed types of abdominal pains seen in some patients who have had too many laparotomies. In so many of these patients there is a high-grade neurotic element, and in some the pain was originally functional, that to select those who have adhesion causalgia would require great care and study. This concept provides an interesting field for one's clinical imagination.

There are some theoretical and some very practical objections to the denervation of abdominal viscera. Theoretically, one might feel that the removal of these God-given portions of the vegetative nervous system may interfere with visceral function. In the thousands of extensive and bilateral denervations done in America for hypertension, such theoretical objections are not substantiated by a solitary observation. From the practical point of view, one must take into consideration the fact that the patient is being deprived of a defence mechanism by the loss of the visceral pain component of his symptomatology. While this is a very real objection, it is not generally as serious as it would, at first glance, appear. The paucity of reports of abdominal catastrophe after splanchnicectomy for hypertension is really amazing. De Takats, S.G.O., December, 1947, reports a painless jaundice in a sympathectomized woman which, at operation, turned out to be due to acute cholecystitis. Carnes Weeks, J.A.M.A., December 21, 1946, reports a painless, undiagnosed and fatal peritonitis due to duodenal ulcer perforation. Bronson Ray, Annals of Surgery, November, 1947, reported the perforation of ulcers in two patients who had had no previous ulcer pain due, they suspect, to bilateral splanchnicectomy. He states, however, that these patients vomited and exhibited all the signs of acute peritonitis so that the diagnosis was made and they were operated upon successfully. It is not uncommon in normal unsympathectomized individuals to have an unheralded ulcer perforation. These are the only four cases of serious surgical abdominal lesion that I could find in the literature. In view of the large number of people undergoing surgery for hypertension, estimated roughly at 5 to 7 thousand, this is a noteworthy observation. While I am definitely not suggesting that sympathetic denervation is in some way a protection against serious visceral disease, the facts are highly suggestive that such may be the case. There are signs, other than pain, of surgical abdominal disease. Intestinal obstruction has its vomiting, constipation and distension. Biliary tract disease has its jaundice. Malignancy of the upper intestinal tract is so rarely diagnosed sufficiently early to affect the prognosis that the absence of its symptoms is of small importance. In many instances, particularly in patients with functional pain or biliary dyskinesia, the gall bladder and appendix have already been removed. In any case, the appendix can be removed and the

gall bladder examined at the time of exploration if coeliac ganglionectomy is decided upon. It should be routine to warn these denervated patients of the fact that their visceral pain mechanism has been removed and to advise appendectomy if this has not been done. Since surgery of this nature may produce unopposed vagus action, a serious problem would arise if the operation seemed indicated in a patient with a history of peptic ulcer. Belgen and Kintner, J.A.M.A., April 19, 1947, report on a patient who had severe and repeated, but painless, gastric haemorrhage after a sympathectomy for hypertension. Previous symptoms were of mild epigastric distress for two years, relieved by milk and baking soda. The haemorrhage was due to an activated duodenal ulcer and extensive gastric resection was done. See also the two cases of Bronson Ray, noted above, which again suggest the ulcer aggravating potentiality of sympathectomy. I have never had to face this circumstance but one could theorize that the addition of vagotomy would solve the problem. On the other hand, Froehlick and Stephan, Presse Medicale, 1942, 50:665, report the cure of four ulcers of the lesser curvature with a one-year follow up by splanchnicectomy and lumbar ganglionectomy.

Since preparing this paper Mason and Pollard, S.G.O., September, 1949, report on 11 peptic ulcer complications in a series of 12 ulcers found after 1498 splanchnicectomies for hypertension. 10 of these 12 ulcers were known or suspected before splanchnicectomy and only four had had pre-operative complications.

My interest in this type of surgery arose in July, 1946. I found an extremely painful carcinoma of the cardia and lower oesophagus to be irremovable on combined thoraco-abdominal exploration. A left ganglionectomy from T6 to T12, combined with splanchnicectomy, was done, recovery was uneventful and the woman left the hospital in nine days complaining only of painless regurgitation of food. In spite of repeated haemorrhage, she did not succumb until two and one-half months later. She died at home from haemorrhage and only required morphine for the last two weeks of life.

The abstracts of case reports which I will present are followed by the patients' own answers to a routine questionnaire, the wording of which is as follows:

"Dear .....:

I am investigating the final result of all patients on whom I have performed the operation that you had done to relieve your pain.

Would you please let me know, in general terms, whether you are pleased with the results of this operation and whether it relieved your pain completely or not.

Let me know if you have noticed any unpleasant effects that you attribute to the operation.

Have you any pain now or have you had pain since your operation? If you have, would you please describe the exact location and character of the pain.

Have you noticed any symptoms, other than pain, that you had before the operation which have been relieved by the operation.

Have you had any change in your bowel habits or have you noticed any difference in the way you pass water?

Does your incision cause you any discomfort?

What has happened to your weight and appetite?

Are you pleased with the result of this operation?

I am anxious to get this information as soon as possible and will be very grateful for your early reply. Would you please answer ALL the above questions and make any other comments you think might help me to assess the final results of this operation.

Please make your reply on the back of this letter.

Yours truly,

....."

I must apologize for the documentary presentation of these cases but it has been difficult to work out a better method in a series where a symptom so subjective as pain is concerned.

The following are reports of eight cases:

Sister H., aged 29. This woman was referred to me in October, 1947, complaining of epigastric pain appearing immediately on eating. The pain went through to her back and was colicky in nature. This was usually followed by vomiting. She had had these symptoms for five years and they had been very severe for the previous two years. The pain had occurred after every meal for the past two years and she had vomited at least once a day during that time. She had lost thirty pounds during that time. She had consulted many doctors and had had repeated gall bladder visualizations and barium series which had always been normal She was found to have had achlorhydria in July, 1947, but the administration of acid had been of no benefit. She had been treated by sedation, various diets, B complex, neurotrasentin and gynergen without avail.

Examination revealed a thin woman and, with the exception of the fact that her pain was located about one and a half inches above, and slightly to the right of the umbilicus, that she had mild chronic mastitis and had a vaginal discharge due to trichomonas, nothing else was revealed. Her Hb was 90%.

She was operated on November 13th, 1947. Her abdomen was thoroughly explored and was negative except for some fine congenital adhesions between the fundus of the gall bladder and the transverse colon and some adhesions of the caecum to the lateral abdominal wall from a previous appendectomy. The right coeliac ganglion was removed by dividing all its connections. The lesser and least splanchnic nerves could not be identified. She made an excellent post-operative recovery and was very excited on the second day because she apparently felt that her symptoms were relieved. She volunteered the information that she had a pleasant sense of warmth in her upper abdomen. The following is her answer to my questionnaire, dated February 22nd, 1949:

"In reply to yor inquiry, I am very happy to be able to tell you that the operation has helped be in many ways. The best proof that I have is that my weight has gone up to 110 pounds although my appetite is very poor. I can do my class work without taking extra rest. The pain in the abdomen has completely left but I have a mild pain in the back coming to the left front still linger although not sharp. I am using Karasal daily for bowels as I have always had trouble with them and they are still very lazy.

In all, doctor, I feel satisfied that all that can be done has been done. Thanking you again for your kind interest.
Sincerely yours,
Sister H."

I have considered this to be an example of functional pain which probably originated in the stomach itself because of the onset immediately after eating. The pre-operative achlorhydria was sufficient protection against the ulcer stimulating potentialities of sympathectomy. She had not complained to me of left sided pain pre-operatively so, naturally, nothing was done to prevent left abdominal pain.

Mrs. W. H., aged 64. I was consulted by this woman in February, 1948. She complained of episodes of acute indigestion occurring two to three hours after meals. The attacks lasted an hour or two. When they first started in November, 1947, they occurred one to two weeks apart but, for the past two months, had occurred much more frequently. They were not related to the ingestion of any particular food. For the past two months, in addition to the attacks, she had developed a constant and increasingly severe epigastric pain which was referred directly through to her back.

Examination revealed a small cachectic looking lady who appeared older than her 64 years. Her blood pressure was 140/80, her abdomen was lax and flat and showed evidence of weight loss. There was some tenderness on deep pressure over the area of the duodenum. The examination was otherwise negative. She had 3,950,000 red cells and her Hb was 79%. Serum amylase showed no increase. Icterus index was 5.5 units. Her barium series and barium enema was normal, her gall bladder failed to visualize with priodax and no calculi were seen.

A pre-operative diagnosis was made of cholecystitis with possible common duct stones and pancreatitis or carcinoma of the head of the pancreas. She was operated upon February 26th, 1948. Her gall bladder was fibrosed and thickened and contained stones. It was removed. Her common duct was dilated and fibrosed and contained one stone. The stone was removed and the duct was drained with a T-tube. Her pancreas was extremely thickened and diffusely hard to the consistency of wood. This seemed to confirm the diagnosis of pancreatitis and, therefore, the right coeliac ganglion was removed to prevent the recurrence of pancreatic pain. This woman made an excellent recovery but on March 3rd a p.o. cholangiogram revealed a dilated duct with two calculi still remaining in the upper part of the common duct. Biliary flushes were instituted twice a day and on March 5th a repeat cholangiogram showed that the stones were still present. In view of this woman's age and generally poor condition, it was felt that no immediate attempt should be made to remove these stones. Since her right coeliac ganglion had been removed, it was realized that pain could not be used as an indication for their removal but it was felt that jaundice or cholangitis would provide sufficient indication if they arose. Consequently the T-tube was removed and she was discharged on March 7th, 1948.

Since leaving the hospital she has had three to four attacks of **left** upper quadrant pain. The first of these required morphine for its relief. Her answer to my questionnaire follows, dated Feb. 7th, 1949:

"You can say to anyone we are very pleased we had you for to do the operating as no one could of did a better one. I wish everyone of your operations are as successful.
If I eat butter or fat pork I feel a wee bit soreness in my right side and a bit on the left of my abdomen. Just a warning I guess. It soon goes away again as I try to watch my diet. I can eat most everything else. I can't thank you enough for what you did for me. If I can answer any more, just please ask.
I am very pleased with my operation. I have no pains since July. We went to Brandon Fair and I ate a few sandwiches with butter, salmon and I had some ham. I think that did it, I had two days of very bad pain.
None what ever. (Referring to the question of any unpleasant effects attributable to the operation.)
I had two spells of bad pain after I came home and one in July and none since. They were the same as before, mostly in the centre of belt line, but only on LEFT side. Just seem to get so full of gas and then start to stab pain every breath so I couldn't hardly get my breath. But that's all gone now. I do get gas but it goes away again.
Bowel habits very good. No difference in passing water.
Have gained some weight — but I sure have a good appetite.
I have no discomfort from incision. As for the operation, I would not know I ever had one.
I am very pleased with results of operation.
Thanking you Dr. Burrell for everything,
Mrs. W. R."

It would appear from subsequent events that at least a part of this woman's symptoms were produced by her pancreatitis. This borne out by the fact that her right coeliac ganglionectomy protected her from recurrence of pain in the right abdomen in spite of the known presence of the common duct stones with pancreatitis. Since the pancreatitis probably persisted in the left half of the gland, it is not surprising that she had these few attacks of left upper quadrant pain.

Mrs. Edward G., aged 27. I was asked to see this woman in consultation in July, 1948. She had had many hospital admissions under five different doctors. At the age of 21 she was operated on for left tubal pregnancy and for some reason both tubes were removed. This was in June, 1942. In December, 1947, this patient was readmitted to St. Boniface Hospital complaining of severe pain in the left lower quadrant, left loin and left lumbar region. She had been in the Misericordia Hospital in February, 1947, for the same pain and, apparently, had been in the St. Boniface Hospital in May, 1947, for this pain. She was cystoscoped on this admission and had pyelograms made. This examination was negative. She was operated upon and her left ovary was removed. It was of small walnut size with a nodular surface and was riddled with pea-size and smaller serous cysts. She was readmitted a few months later. Complete

urological investigation was again negative. In March, 1948, she was admitted again with the same symptoms. These had not left her during the interval. She was found to be extremely tender at this time in the left lower quadrant and left loin. The intern thought she was neurotic and her physician treated her for pelvic cellulitis with penicillin. She was readmitted in June, 1948, and I first saw her during this admission. Before I saw her she had again been investigated urologically and had a complete barium series, both of which were negative. She had the same complaints of constant and severe left abdominal pain sometimes worse in the left pelvis and sometimes more severe in the left kidney area. At times, she said the pain radiated around her loin in a fashion similar to renal colic. I examined her repeatedly and she was always extremely tender in these areas. One gained the impression, from interviewing and examining her, that there was a huge neurotic element but the persistence of her symptoms and the absence of positive findings, which would explain her pain on all her previous examinations and operations, suggested that she would be a good candidate for visceral denervation.

On July 7th, 1948, through the eleventh left rib bed, all her splanchnic nerves and the tenth, eleventh and twelfth thoracic ganglia and the left coeliac ganglion were removed. This patient made a good recovery except that she was extremely apprehensive for the first few days. She was discharged relieved of her symptoms on July 19th. Her answer to my questionnaire, dated February 8th, 1949, follows:

"Forgive me for not answering sooner. I was away at Mother's on the farm and just got your letter a few days ago. I am glad to say I feel much better than I felt before my operation. The pains in my back and left side are gone but I still suffer quite a bit with cramps when I get my periods nearly every month. The last time I saw you at the office you told me to go and see Dr. Howden and so I did. I felt really sick then. Dr. Howden told me I had inflammation of the bladder so he gave me a prescription and told me to go back in a few weeks. After two weeks everything was okay.

I still have those terrible sharp pains in my vagina. I had those before the operation and still have them. I get them quite often and sometimes so bad that I feel weak. A couple of imes I lost blood after passing my water. I have been completely relieved of the pains in my back and left side, pains I had before the operation. I don't pass my water as often as I did. I haven't weighed myself since operation but I think I have gained weight. My appetite is good. My incision doesn't hurt unless I press hard on it. I have quite a lot of pains in both my breasts at least two weeks before my periods. As up to now, I have no complaints to make about the operation.

Yours truly,

Mrs. E. G."

Goetz has pointed out that the nerve supply for the kidney has its outflow from the first or second lumbar ganglia. In the above noted case these ganglia were not removed but it is possible that the kidney was denervated by the removal of the coeliac ganglion since the renal outflow may traverse the coeliac ganglion on its way to aorticorenal ganglion. The patient's pain appeared greatest in the left pelvis and, since it followed her left tubal pregnancy, I felt that in some way it had its origin in functional or adhesive irritation of the left ovarian vessels. The operation has been successful in relieving her of her left abdominal and lumbar pain. Naturally sympathectomy of this type cannot be expected to relieve dysmenorrhoea.

Miss D. H., aged 25. Ever since this patient had had her appendix removed in 1940, she has had a right lower quadrant pain which she describes as pulling and burning in character. By 1944 the pain had become almost constant and was very severe. In 1944 she was operated upon again in Brandon for the release of adhesions and her caecum at this time was extensively mobilized. This operation was followed by the relief of her pain for six weeks, after which the discomfort returned with increasing severity. In October, 1948, this patient had an emergency operation for the removal of a twisted right ovarian cyst and since then the original pain has continued. Since October, 1948, the patient had been hospitalized repeatedly in the country and tried on various forms of therapy. During most of this time she had been taking demerol orally for the control of her pain. I first saw this girl in December, 1948. Barium series at this time was negative. She was a healthy appearing girl with negative physical findings except for three well healed incisions in her right lower quadrant. This whole area was tender on deep pressure. Her complaints were as above; namely, a constant pulling burning pain in this region made worse by effort and relieved somewhat by rest. The symptoms had been so severe for the previous three months that she felt unable to continue her work. I suggested trying the effects of neurotrasentin and amyl nitrite. She returned in January, 1949, complaining that the pain was much worse. The amyl nitrite would relieve the pain, but for such a brief time that she did not feel it worth while continuing on this treatment. Since she had been explored on three occasions and since her barium series was negative, I did not feel that further abdominal investigation was necessary. The burning character of the pain suggested to me that this pain may be of the nature of causalgia and the fact that she also described it as pulling suggested that intra-peritoneal adhesions were the basis for this causalgia. The patient stated, and I felt, that this pain was intra-abdominal and not in her abdominal wall or skin. The skin of the right lower quadrant was not hyperaesthetic. The pain was sufficiently incapacitating to warrant surgical treatment and the patient welcomed this suggestion. Therefore, on January 11th, 1949, through the bed of her right tenth rib, the sympathetic trunk from T8 to T12 was removed inclusively along with her splanchnic nerves and her right coeliac ganglion. As often

happens after thoracic sympathectomies, this patient had a lot of wound pain post-operatively. Her tenth intercostal nerve had been crushed and divided in an effort to prevent this but, as usual, this procedure was ineffectual. During her stay in the hospital she had repeated blocks of the ninth, tenth and eleventh roots and when she left the hospital on January 20th, this painful hyperaesthesia had subsided considerably but was still present. The pulling burning pain originally complained of had disappeared.

I received her answer to my questionnaire, dated Feb. 5th, 1949:

"Since returning from the hospital, I have had some pain but not the same as it was before my operation. The skin is sore to touch along my waistline and my clothing bothers me. I have noticed no change in my bowel habits and my appetite is fairly good. My incision is a little sore but really nothing to complain about. I haven't noticed any unpleasant effects other than this pain since my operation."

On receiving this letter, I asked the patient to return to see me. She presented herself on March 14th. The burning pulling pain had disappeared but the skin of her right lower quadrant was extremely hyperaesthetic and squeezing this skin elicited the pain that she had been complaining of since her operation. Novocaine infiltration of this area gave her relief but the pain returned by the next day. I then sprayed the whole area with ethyl chloride and she returned to her home in the country. I heard from her local doctor a week later that this had given her relief for six days but that the pain had recurred again although it was not as severe as it had been. I suggested repeated novocaine infiltrations.

I saw this patient again in June, 1949. She was extremely pleased, having had no pain for the previous six weeks. On examination, no tenderness could be demonstrated. She is still symptom-free.

This case, I feel, is an example of what could be called adhesion causalgia. Sympathetic denervation should be effective in relieving the pain of visceral adhesions and was successful in this case. Unfortunately, there is always considerable pain and post-operative hyperaesthesia whenever the sympathetic chain is removed trans-thoracically. This type of pain is never as marked or persistent when a thoracotomy is done for other purposes (such as vagotomy, lobectomy or oesophagectomy), nor is it found after lumbar or cervical sympathectomies. This unpleasant sequel of thoracic sympathectomy has been universally noted and no solution seems to have been found. I do not believe the observation has been made by others that the pain is confined to patients who have a thoracotomy for sympathectomy. As a rule the pain does not persist for any great length of time (one to four weeks) but, in the above-noted case, it lasted for an embarrassingly long time. Injecting the involved nerves and the one above and the one below with proctocaine or crushing these nerves at the time of the operation does not avoid the pain. Lately, in addition to crushing and dividing the involved nerves, I have resected a short segment of the accompanying intercostal vessels but this has proved ineffectual in preventing the pain. Sometimes this pain disappears with dramatic suddenness. Usually it subsides gradually and sometimes it can be made to disappear with an ethyl chloride spray. It is difficult to explain why this pain should follow a thoracotomy incision only when a sympathectomy is done. It naturally must have something to do with the sympathectomy. One would think that a sympathectomy would relieve or prevent this type of painful hyperaesthesia but it unfortunately seems to cause it. It must be remembered, of course, that while sympathectomies of this type effectively remove afferent fibres, originating in viscera; the afferent fibres approaching the cord from the abdominal wall are not touched since they have their pathway in somatic nerves and enter the cord without going through the sympathetic chain. How this anatomical fact is linked with the explanation of this bothersome pain is unknown to me.

Mrs. H. S., aged 58. I saw this patient in June, 1948, in consultation. She had had a cholecystectomy in 1944. In March, 1947, she had a severe attack of right upper quadrant pain which radiated straight through to her back. This was treated by diet and she was fine until April, 1948. Since then she has had recurring attacks of sudden severe pain in the right upper quadrant which radiated straight through to her back. These attacks lasted one to three hours and recurred every two or three days. She was nauseated with the attacks and often vomited but she was never jaundiced. At the time I saw her she had no abdominal tenderness, her icterus index was normal and serum amylase was slightly increased. I felt that these symptoms indicated either a common duct stone, biliary dyskinesia, or interstitial pancreatitis and laparotomy was advised. Therefore, on June 24th, 1948, her abdomen was opened through an inverted V incision. After separating many adhesions the common duct was found not dilated and only slightly thickened but it was noted that the mucosa of the duct was trabeculated. No stones were found within the duct but I was unable to pass dilators of any size through the ampulla into the duodenum. The head of the pancreas was manifestly larger than normal and extremely hard but did not suggest carcinoma. It was felt, at the time of the operation, since no stones were found that these symptoms were due to either dyskinesia or pancreatitis or both. The common duct, therefore, was drained with a T-tube and her right coeliac ganglion was removed. She made an uneventful

recovery and on June 30th a cholangiogram was done and I was surprised to find filling defects at the lower end of the common duct representing the presence of two stones. Biliary flushes were started twice a day and cholangiograms on July 2nd and July 5th showed that the stones were still present. The woman was sent home with her T-tube in place and advised to return in a month. She notified me about four weeks later that she had accidentally pulled the tube out. The biliary fistula closed in two days suggesting that there was no biliary obstruction. She had had no pain since leaving the hospital and it could be surmised by the rapid closure of her fistula that she had passed the stones.

Her answer to my questionnaire, dated Feb. 3rd, 1949, follows:

"This is a reply to your letter of January 30th, 1949, asking me my state of health, etc. I can truthfully say that it is wonderful to be able to have one's appetite back and gaining weight steadily. My bowel movement is fine. I pass my water without any trouble. The only thing is that my incision gives me a prickly feeling in cold or changing weather; otherwise, my health in general is fine. Hoping this gives you the information you want, I remain.
Sincerely yours,
Mrs. H. S."

In this case it is difficult to say what part pancreatitis played in this woman's pain, although it is likely that pain was mainly due to her stones. Since the stones were not removed, her immediate relief of pain can only be explained by the effectiveness of the coeliac ganglionectomy. Biliary flush is usually a painful procedure and it was interesting to note that, in this case, although she did vomit after each flush, she had no pain.

Mrs. J. H., aged 52. I saw this woman in consultation in August, 1948, for what her doctor called intractable right sided abdominal pain. She had had a hysterectomy five years previously. In March, 1947, she had had a stroke with a transient left hemiplegia and in September, 1947, she had a recurrence of this cerebral accident. When I saw her she had completely recovered the use of her left arm and left leg. In February, 1948, she started to complain of attacks of severe right sided abdominal pain. These were, apparently, at first in the right upper quadrant but, when I saw her, they were wide spread and involved the whole right abdomen. The pain came in attacks and radiated around to the right loin and back. She would cry and throw herself around in bed during these attacks. K.U.B. investigation was negative and her gall bladder visualized and showed one large calculus. Her blood pressure, when I saw her, was 230/120. Her behavior during an attack suggested a large functional element. It certainly did not resemble biliary pain in any way. I had been asked to see her with the idea of removing her gall bladder but, as I felt that more than this may be required and in view of the fact that she was an extremely poor operative risk, I decided against surgical treatment and advised the woman of this fact. For the next three or four days her pain was almost constant and she pleaded repeatedly for surgical relief. After careful sizing up by our anaesthetists, it was decided to explore her. On August 19th, 1948, her abdomen was opened by an inverted V incision. Many dense adhesions of omentum and transverse colon to her old pelvic scar were released. During this procedure her ileum was perforated and this opening was closed with silk. There was evidence of an old peritonitis in that there were many pathological adhesions in her pelvis, around her gall bladder and stomach and over the dome of her liver. Her gall bladder was thin-walled and contained one large stone and was removed. Since the release of some of her pelvic adhesions and the removal of her gall bladder was not thought to be sufficient to relieve her pain, her right coeliac ganglion was removed. Post-operatively this woman developed a mechanical small intestinal obstruction which was relieved by decompression with a Cantor tube. Subsequently, her convalescence was good and she was discharged on September 5th having had no pain since the decompression of her obstruction.

Her answer to my questionnaire, dated March 16th, 1949, follows:

"In answer to your letter regarding my operation I must say I feel somewhat better and has relieved me of most of pain. The pain now is at bottom of incision on right side which causes a sharp pain and some soreness. My kidneys are much weaker, causing me to pass my water more frequently and two or three times at night. My bowels are much better, just a slight pain at bottom of back at times. Have gained little weight and appetite fair but cannot eat heavy meal as I have indigestion bad. I noticed my left hand bothers me more since operation. It gets very numb with a dull ache and a slight swelling, also a pain in left side of heart and my blood pressure is up and pain at top of head."

From this very garbled reply I would gather the attacks of pain she originally complained of had been relieved. Although one cannot be certain, it is highly unlikely that the removal of her very innocent appearing gall bladder and the release of a few pelvic adhesions alone could account for this relief. The greater percentage of her adhesions were never released. I believe that this woman's pain was an example of adhesion causalgia with a functional basis and greatly exaggerated by a low pain threshold and a very neurotic temperament. The post-operative mechanical obstruction demonstrated the formation of more adhesions. I feel that the addition of coeliac ganglionectomy to this women's operation was responsible for the good result.

Mrs. M. H., widow, aged 49. This woman was referred to me in April, 1947, for a cholecystectomy. She had had attacks of biliary colic for seven years, much more frequent in the previous six weeks. Her gall bladder failed to visualize with priodax and it was removed through a Kocher

incision on May 2nd, 1947. The common duct was small and of normal color and was not explored. This woman made an uneventful recovery and on May 9th I did an haemorrhoidectomy on her. She was discharged on May 15th. She returned to my office on September 3rd, 1947. She had had two brief attacks of right upper quadrant pain radiating through to her back. I thought these might indicate biliary dyskinesia and put her on neurotrasentin four times a day and gave her some ampoules of amyl nitrite for use during future attacks. She returned on January 28th, 1948, having had frequent recurrence of these attacks. She said they were unrelieved by amyl nitrite and neurotrasentin and that she had had to have repeated hypos for these attacks. She had had three attacks in the previous month. She had never noticed jaundice or high colored urine. On examination she was slightly tender high in the epigastrium and more tender over the head of her pancreas and the region of her removed gall bladder. Barium series at this time was negative. I felt that these attacks could signify a common duct stone, biliary dyskinesia or pancreatitis. The brief unjaundiced character of the attacks suggested dyskinesia as the most likely cause. On February 11th, 1948, her abdomen was opened through an inverted V incision. Her common duct was of normal blue color and of actually smaller than normal calibre. It was opened and explored and contained no stones. Dilators were readily passed into the duodenum but the sphincter was not actively dilated. The pancreas was diffusely firmer than normal but not greatly so. The absence of sufficient pathology to explain these severe attacks was quite amazing. It was felt that this must indicate dyskinesia so her right coeliac ganglion was removed. Since her common duct had been opened it was drained with a T-tube. A cholangiogram on February 18th showed that the diodrast passed readily into the duodenum, that the ducts were not dilated and that no stones could be seen. The woman was discharged on February 23rd after her T-tube had been removed. She had a normal painless convalescence.

Her answer to my questionnaire, dated Feb. 1st, 1949, was very lengthy. The essence of it is that, in March, 1948, she had started to have attacks of left upper quadrant pain radiating through to her back, often accompanied by vomiting. These attacks were usually relieved by vomiting and were not related to her meals. She had been having about one attack a month and the attacks had lasted about two days. In the meantime, she had consulted a few other doctors and one of the local clinics in regard to these left upper quadrant pains. I, therefore, asked her to call in and see me. She was in my office on March 16th, 1949, and her history was as above. Abdominal examination was negative except for deep tenderness in the left upper quadrant. There was no tenderness elsewhere. Her incision was well healed and not painful. This woman is quite nervous and is still very depressed over the loss of her husband who died three years ago from carcinoma of the stomach. The regular pattern of the attacks suggest that they are not psychogenic or neurotic but they could be functional. I think, though, that they are really pancreatic in origin and that this particular post-cholecystectomy syndrome was due to pancreatitis and not dyskinesia and that it would have been wise to have removed both coeliac ganglia. That her previous right sided pain is now confined to her left side, indicates the effectiveness of her right coeliac ganglionectomy.

Mrs. Donat A., aged 48. I was asked to see this patient on March 5th, 1949, in regard to a chronic pain in the right kidney area. She was a healthy appearing woman whose only complaint was a persistent pain in the right loin and right upper quadrant. Examination was completely negative except for operative scars on the abdomen and a definitely tender right kidney, palpation of which exaggerated the pain complained of. She had had six pregnancies and it was during the first of these, twenty years previously, that she was told she had an infection in her right kidney. The pain had persisted since that time. Although she had been investigated and treated by a number of physicians, she had never had relief. She knew of nothing which would ease the pain but she claimed that it was made worse by activity. She had had frequent episodes during which the pain was greatly exaggerated. These would last for weeks at a time and seemed to have no apparent cause. She had had repeated urological consultations in the past twenty years including one on this particular admission. All of these urological investigations failed to disclose pathology in the urinary tract.

It was my opinion that the pain was renal in origin because it could be intensified by pressure on the right kidney and, since in twenty years no pathology could be found to explain the symptoms, I suggested that it had a functional basis, possibly dependent on the old pyelonephritis of pregnancy she was supposed to have had. I advised she be offered a renal denervation as a means of pain relief. The patient unhesitatingly accepted surgical treatment indicating that the pain was of a sufficiently disabling intensity to make the suggestion of surgical relief acceptable.

Accordingly, on March 12th, 1949, her splanchnic nerves, coeliac ganglion and the sympathetic chain from T9 to L2 inclusive were removed on the right side through the bed of the eleventh rib. The diaphragm was split in the direction of its fibres to gain access to the abdomen. The kidney was normal to palpation but, unfortunately, no renal

biopsy was taken. She made an uneventful recovery and her wound healed well but she did develop the usual post-operative pain and hyperaesthesia so characteristic of trans-thoracic sympathectomy. This was relieved repeatedly but not permanently by ethyl chloride spray during her hospital stay. She was discharged March 22nd, still bothered by these complaints. I saw her in the office two weeks later and the hyperaesthesia had greatly subsided but was still present. I saw her again on June 7th, 1949. At this time she stated that she had complete freedom from pain for the past six weeks. The cutaneous-hyperaesthesia had completely disappeared.

I do not believe there are any important comments to be made on this case. The operation successfully relieved her pain as could be expected, the denervation was unnecessarily extensive in order to ensure pain relief. It is unfortunate that no renal biopsy was taken—her pre-operative blood pressure was 130/86 and on June 7th, 1949, it was 139/78.

**Summary**

1. A brief outline of the history of visceral denervation for abdominal pain is presented.

2. No attempt is made to include such well established sympathetic denervations as ovarian and presacral neurectomies nor to discuss cardiac sympathectomy or a number of both successful and unsuccessful experiences with alcohol block for the relief of organic visceral pain.

3. An attempt is made to distinguish abdominal pain which is functional in origin and the abdominal complaints of psycho-neurotic patients.

4. A few abdominal pains can be explained in no other way except on the basis of adhesions. This pain mechanism has been called adhesion causalgia and is distinct from the usual mechanical obstructive phenomena with which adhesions are usually associated. This concept of a causalgic nature of the pain in some cases of adhesions with pain is believed to be new.

5. The possible ulcer aggravating potentialities of gastric sympathectomy are noted.

6. The possible unfortunate effects of visceral denervation in the masking of subsequent abdominal disease are mentioned. It is suggested that these effects are over-emphasized but should, nevertheless, be kept in mind.

7. Mention is made of the almost constant post-operative pain and hyperaesthesia which follows thoracotomy for sympathectomy and it is pointed out that this phenomenon does not follow thoracotomy done for any other purpose. The pain is often persistent but has never been permanent. It cannot, as yet, be explained.

8. An attempt is made to establish a wider basis for visceral denervation and to suggest which cases are suitable for abdominal coeliac ganglionectomy and which cases are better handled by some other type of sympathetic denervation.

9. A series of eight cases representative of this type of surgery are reported, all successful in effecting the pain relief originally planned.

10. This is a small, generally neglected, but highly interesting field of surgery. Particularly important is the suggested, but unverified, reversal of pathology said to occur in interstitial pancreatitis after sympathetic denervation.

Since the preparation of this paper another very painful carcinoma of the middle ½ of the oesphagus was found on June 10, 1949, to be irremovable. A left thoracic ganglionectomy and splanchnicectomy from T4 to T11 or 12 was done. When last seen, Nov. 1, 1949, this man was very comfortable and completely free from pain.

# OBITUARY

### Dr. McGillivray Stewart Fraser

Dr. McGillivray Stewart Fraser died on October 26 in the Winnipeg General Hospital, aged 89. For the past thirty-four years he had resided in Winnipeg. In 1916 he became executive secretary of the provincial board of health and in the same year, when the late Dr. Armstrong was Provincial Secretary and Minister of Health, he organized a public health nursing group in Manitoba, the first of its kind in Canada. He served as medical director of public health nurses in Manitoba from 1916 to 1928 when the department of Health and Public Welfare was organized, and continued with this department until his retirement in 1931.

Born at White Lake, Ont., he graduated from Toronto Medical College and the University of Manitoba (M.D. 1890). Post graduate work was carried on in Edinburgh. He practised in Brandon for twenty-five years before coming to Winnipeg. He is survived by three daughters and two grandchildren. Burial was from First Presbyterian Church, Brandon.

# MEDICINE

## Normal Fear

J. D. Adamson, M.D., M.R.C.P.(E), F.R.C.P.(C)

### I

It is interesting to speculate upon what posterity will think of twentieth century medicine. No doubt, our great-grandchildren will agree with our opinion that during the first fifty years we have advanced more than during the whole of the Christian era. What particular features of modern medicine will be selected as being greatest? The pulp, paper and tabloid addict will immeddiately think of surgery. Certainly anaesthesia and asepsis have produced an exuberant growth in surgery and created a veritable golden age for its technicians. But in spite of its brilliance and popular appeal, surgical contribution to the prolongation of life has been insignificant in comparison to what has been accomplished by bacteriology and biochemistry in the prevention and cure of infections. The consequent saving of life has doubled its expectancy: most of us would judge this to have been the greatest contribution of all time to man's welfare. But posterity may question this. It may be that in time our age may be celebrated because of its "new look" at man's mind and its aberrations; it may become famous, not for the material progress of which we are so proud, but as the age in which man discovered and confronted his own psyche.

It seems incredible that since the end of the Greek era, medicine has been almost totally physical and mechanistic in practice. Until our own day the study of mental processes was considered quite outside the field of legitimate medicine. The mind was regarded to be divine in origin and completely metaphysical in operation. Mental disease was thought to be due to diabolical influences and its victims inspired nothing but fear; they were treated by the church, by the people and by the profession as being less than human and no attempt was made at rational or even humane management.

The reaction against this abject and hopeless attitude was prolonged and bitter and it was not led by the medical profession. Protest against mysticism has been expressed or implied from time to time by the best intellects throughout history, by the Greek philosophers and by many students during the Renaissance. Enlightened skepticism began to be particularly manifest in the literature of the late 18th century; the advancing thought of that day was well expressed by Pope, when he said:

"Know then thyself; presume not God to scan
The proper study of mankind is man."

Such an attitude, of course, was not popular in an age still dominated by ecclesiastical dogma and held in thrall by the tyranny of the middle ages. Men had scarcely become accustomed to the idea of anatomizing the body and they had strong inhibitions against a critical examination of the sacred realm of the mind.

In the last quarter of the 18th century the first demonstration that certain mental states could be induced and could influence physical disabilities was made by Mesmer. He was quite ignorant of the significance of his "magnetism" by which he alleviated neurotic symptoms and he was inspired largely by vanity and cupidity. But he did introduce what was later called "mesmerism," which method of suggestion finally attained medical respectability one hundred years later in the hands of Charcot under the name of "hypnotism." (Incidentally, a disciple of Mesmer cured Mary Baker Eddy (1861) of hysterical paralysis and indirectly initiated Christian Science). Psychiatrists would no doubt be much incensed if we were to refer to Mesmer as the father of modern psychiatry; perhaps he should be considered to be its rather disreputable but colorful grandfather. He took the Parisian populace by storm when, in his seances, he induced a variety of mass hysteria and influenced many neurotic symptoms. The rigid, bigoted and ultra conservative profession of the day quite properly decided that physical magnetism had nothing to do with Mesmer's results, but they failed to appreciate the far reaching significance of his striking demonstration of the power of suggestion. No doubt, they were restrained by fear and recoiled from the enormity of probing into the soul of mankind as being heretical and profane or even blasphemous.

The conflict that raged about mesmerism and hypnotism and their implications continued for over one hundred years. During that time few reputable medical men took any real interest. It was generally regarded as a form of charlatanry and used more as a vaudeville stunt than a controlled therapeutic measure. Gradually it overcame medical prejudice and stimulated investigation. It was one of the principal influences that created the Freudian School and it was the stimulus that initiated modern psychological study.

Since the beginning of the present century, opinions about the mind have been revolutionized. Freud's theories—especially his concept of the unconscious mind—have placed psychological investigation on a par with other biological sciences. It is now realized that mental processes and human behaviour are not haphazard nor are they con-

trolled by inscrutable powers, divine or diabolical. They are the inevitable and rational product of what has gone before them and are subject to natural evolution. It can be said that Freud has done for psychology what Darwin did for biology.

If it was hard for our grandfathers to accept the belief that our physical being has roots that are common with the beasts, it was much more difficult for our fathers to believe that our minds have a similar earthy origin. But the prejudice has been largely overcome among enlightened people and mental processes are being thoroughly anatomized by a large variety of investigators. Nowadays there are very few cultural, commercial or clinical activities which have not got a "psychological angle." All modern script writers, novelists, columnists and poets are familiar with the jargon of modern psychological "concepts"; they are on intimate terms with "complexes," (especially the "Oedipus-complex"), "the libido," "the id," "defence mechanisms," etc. Psychologists are employed by many large commercial firms not only in selecting personnel but in planning techniques for buying and selling.

Psychological medicine has had a luxuriant and diffuse growth in our day and has already divided itself into a multitude of branches. The vast field of inquiry that it covers represents only a fraction of its possible scope. In comparison with other divisions of medicine it is merely on the threshold. Almost the whole subject awaits exploration and one cannot even guess at the profound effects on sociology and medicine that may result from continued study. We ourselves are too close to this revolution and too intimately involved to give a disinterested judgment but it may well be that we are participating in the greatest upheaval in the history of medicine. This seems inevitable when one contemplates the domination of mental activities and emotional states over the daily life of mankind.

Speculation as to the future of psychiatry is, of course, of no immediate value to us. We might better ask: What has psychiatric medicine done for the welfare of mankind up to now? Or, more specifically: What part of these newer concepts can with benefit be applied to the daily practice of medicine?

There is, of course, a vast divergence of opinion as to what modern psychiatry can do for the neurotic person. There are still many medical men who cling to the idea that the neurotic is simply a weak, perverse or cowardly person who deserves only stern discipline and punitive treatment. The modern psychiatrist who treats them is therefore a menace and by his vapourings he encourages this variety of spinelessness. On the other end of the scale, we have the Freudian psycho-analyst who believes that salvation for the neurotic lies in a series of several hundred seances with a highly trained and accredited psycho-therapist. The ultimate truth will probably be found somewhere between these two poles. In the meantime, every one of us must, in our practice and in our thinking, assume a position somewhere between complete nihilism and unreserved faith. Only those who practise in a very restricted specialty or persist in a narrow outlook can possibly remain indifferent. On the other hand, psycho-analysis is evidently not the solution. It has contributed enormously to the knowledge of mental processes but, as a method of helping all the neurotic, it is not practical; one could as well attempt to transport Manitoba's grain crop to the seaboard with a teaspoon.

The difficulty of individual orientation in the complex world of modern psychiatrical practice is often attributed to the psychiatrists themselves; indeed, one sometimes feels that each one of them has spent much of his time elaborating his own creeds and proving all his confreres to be misguided; each is inclined to fabricate a jargon of his own which is often quite incomprehensible to ordinary practitioners. This common criticism is probably unjust. In reality, this chaotic state of affairs has not arisen because of psychiatrists but because of the immaturity and endless complexity of psychiatry itself. It can be compared to a very young and rapidly growing infant—bulky but weak, active but unco-ordinated, vocal but incoherent, wasting its young vigor in a thousand discordant cries and grotesque efforts. It has not yet developed to the point of purposeful and productive activity. The practical principles of psychotherapy have not yet crystallized out into a form which is universally recognized nor easily transmitted; the science is ahead of the art, theory is ahead of practice. Because of its very nature, it cannot be taught as a system of cold, incontrovertible facts as some other parts of medicine may be. For these reasons, the world of the psychiatrist often appears to practitioners as a remote and forbidding region.

But in spite of these difficulties, which are inherent, there have emerged some simple concepts that can be of daily use to all practitioners who are not incurable materialists. One of these is concerned with the biology of fear. What I shall say will be about the normal emotion of fear and is the distillation—or the dregs, perhaps—of desultory reading and of experience. Significant experience commenced with the astounding and humiliating discovery of intense fear in myself and nearly all my associates when first under fire in 1915. Later, in 1919, I spent a year in the study and treatment of so-called "shell shock" cases. Since then I have experienced all the difficulties and doubts of any practitioner who has given

serious thought to "functional" cases. During these years, I have had much pleasant association with many psychiatrists and have seen them emerge from semi-isolation to become indispensable members of every enlightened medical group.

## II

The word "fear" is one of the commonest abstract terms in our language. We all hear it used many times each day. It may mean slight and unimportant apprehension; for example, we often say we are "afraid" it might rain, or "afraid" that we might be late to work, etc. In contrast to this every day casual use, it is also used to indicate the most intense and devastating of all our emotions. Montaigne has said: "It is fear that I stand most in fear of; in sharpness it exceeds every other feeling."

Most of us have given little thought to the meaning of the word or to the precise nature of the emotion and vastly divergent opinions would be given by different people. When a grizzled warrior speaks of fear, he is likely to mean the discreditable feelings of a bad soldier in the firing line—almost identical with cowardice. The cleric often means the apprehension commonly felt when we think of the inscrutability of life, death and what is to follow—something akin to godliness or awe. It is common for politicians and even statesmen in their more expansive moments to offer us freedom from fear, by which they probably mean economic and physical security extending from the cradle to the grave and from the personal to the international sphere; a handsome but utterly fantastic offer. When most people speak of fear, they mean the disagreeable, indefinable sensations felt when they or any of their family are threatened with injury. The psychiatrist thinks of fear as the commonest of all the emotions; it is felt by every normal animal, human or otherwise, very frequently throughout life; it helps to determine our behaviour, good or bad; its effects contribute to and explain a large part of human suffering; it does much to account for fundamental beliefs and prejudices. If these psychological propositions are true—and there can be no reasonable doubt that they are—it is imperative that all of us should have some elementary knowledge about the recognition and treatment of fear. A partial understanding of fear and its somatic effects can prevent much of the devastation that it may cause. Such an understanding is possible for all of us. It is true that we may not understand the psychological intricacies, but on a matter with which we all have daily experience a little thought can produce valuable insight.

In our effort to understand fear we must first comprehend the fundamental vital urge. What is it that impels every living thing to cling tenaciously to life? Why is it that normal people fight desperately to prolong life for a few days or hours, even though they may be utterly broken in body and estate and when peace and comfort can never be hoped for? Why is it that no animal ever takes its own life no matter how painful its existence may be, and when a man destroys himself, it is usually conceded that he has been unbalanced or at least eccentric? This complete preoccupation of life with its own perpetuation is accounted for by presuming the existence of an instinct of self-preservation. This blind, urgent and insistent instinct is the mainspring of life and the key to all the other inherent tendencies. It embraces more than survival of the individual; it operates to preserve the species, it demands reproduction and in higher animals protection of offspring. Without it, all life on earth would soon become extinct. Let us consider the biological mechanisms by which this profound impulse operates.

The dominant biological rules of life are common to all living animals. We may appreciate these basic responses to environment best by observation of the lowest forms of life. For that reason I refer you first to the humble amoeba. His life consists of the simple business of flowing about in a watery medium, exchanging gases and engulfing various particles which serve to nourish his single cell. If and when he prospers, he performs his duty to posterity by simply dividing into two separate individuals. If the environment is favorable, there is nothing to stop him; he must have the proper temperature, the right amount of oxygen and available food besides other conditions. But circumstances for him are not always propitious and to survive he must be able to vary his tactics to suit the hazards of life. That is, he must have some mechanism for self-preservation. The amoeba's one defence against inhospitable surroundings is retreat, withdrawal, flight. When any element in his little world suddenly changes for the worse, he immediately goes into reverse in an active effort to escape. If this simple manoeuvre is not sufficient or appropriate, he may retreat passively by rolling himself into a globule with a relatively resistant shell which protects him for a time from injury or death. He has literally crawled into his shell, from which he may emerge when, and if, conditions improve.

Chart I illustrates the reaction of the amoeba to danger.

**Chart I**

**AMOEBA**

**Preservation** (Primary preoccupation of life)

\+

**Danger** (Sudden change of environment)

=

**Retreat** (Sole defence mechanism)

| Passive (Encysting) | Active (Flight) |
|---|---|
| (Depression of Vital Functions) | (Enhanced Vital Functions) |

This escape manoeuvre (expressed by the simple formula: preservation + danger = retreat) must be associated with physiological changes involving the total metabolism. In passive retreat the vital functions are depressed or paralyzed; in active retreat they are enhanced.

The retreat instinct, as exemplified by the amoeba, is a protective device common to every animal from the lowest to the most highly disciplined human being. It is the single inherent instrument of self-preservation with which all of us are born and may be defined as the irrepressible impulse to get away from any sudden change in environment which, in effect, is danger.

It becomes modified, however, in higher animals. In all animals danger inspires the need to retire and mobilizes the necessary dynamic forces. This involves profound physiological changes in preparation for violent activity. The principal effects are increase in pulse rate and blood pressure, mobilization of sugar, augmented supply of blood to the muscles at the expense of the viscera, and many other changes. At some unknown level in the animal kingdom, consciousness to the sudden visceral changes develops. Direct observation and other more scientific tests convince us that such consciousness has undoubtedly appeared in the mammals. These sensations are the beginning of fear. It is much more difficult to know at what level of development the psychological changes associated with perception of danger first appears.

Chart II shows the reflex activities that might take place in a wolf in face of danger. Associated emotional states are suggested, though they are probably only a primitive anticipation of what is produced in man.

**Chart II**

**WOLF**

**Preservation + Danger = Retreat**

(associated with physiological changes and possibly psychological changes called **Fear**)

| PASSIVE | ACTIVE |
|---|---|
| To earth | (a) Free flight = ESCAPE (Joy, Elation) |
| Immobilization | (b) Obstructed flight = FIGHT (Anger) |
| Feigning death | 1. Physical obstruction = FIGHT (Fear becomes Rage) |
| Paralysis | 2. Conflicting instincts (e.g., hunger, mating, parental, curiosity) = emotional conflict, frustration, anxiety, etc. (variants of fear) |
| Camouflage | |

This spontaneous reaction to danger is an elaboration of what is seen in the amoeba. Passive retreat in animals is affected by various devices, all of which are variations on the immobilization and hiding theme. It has become proverbial as the "ostrich method." Active retreat takes place by flight. But there is now a complication in comparison to what takes place in the amoeba; if there is obstruction to flight, most animals will under certain circumstances take the offensive and fight. The obstruction to free flight might be by physical interception or it may be because of the competition of some other instinct at the moment (e.g., mating, protection of young, hunger or curiosity). Under such domination many animals will face obvious danger. Some degree of conflict will arise and persist for a time when two instincts struggle for domination, e.g., when the animal is torn between hunger and fear. But such divergent impulses cannot prevail for long and, when the conflict is over, they are immediately forgotten. After the flight or the fight which is usually brief, the difficulty is solved one way or another (death or escape) and, if he survives, the animal resumes a normal life. In his effort, he has blown off the physiological head of steam generated for the purpose; he is dead or purged of his turmoil.

Fundamentally, the perception of danger initiates a similar train of reflex events in man. He experiences the primitive urge to escape by flight and in preparation, the mechanisms for violent effort are mobilized by the sympathetic nervous system. But besides these physiological changes which occur in all animals, man experiences certain subjective sensations of which we all have daily experience. Some of these are the direct physical effect of physiological changes, for example, palpitation and tremor. But the most striking effect in man during preparation for flight is psychical; he is immediately plunged into disagreeable emotional turbulence which we call fear.

Fear therefore is an integral and inevitable part of the mechanism of defence against danger; it can be defined as the sum of all those physical and psychical changes that appear in a man preparing for flight. These signs and symptoms of fear (which will later be considered in detail) will persist until escape is effected. They will be modified through a wide range in accordance with the course of events after the perception of danger. The emotional component of fear particularly is capable of vast mutation. Indeed, nearly all of the disagreeable emotional states have their origin in fear. For example, anger is merely fear that has been transformed by the necessity of conflict; grief is the anticipation of difficulties that follow loss or bereavement.

In animals living under natural conditions, the necessity for retreat must be frequent and the associated physiological changes and whatever psychical states that may accompany them must be common. The resolution of this state of preparedness or tension is, however, simple, direct and immediate. In contrast to animals, man is rarely allowed to respond to danger by instinctive and satisfactory activity. For better or for worse, he has developed a complex cerebrum with all the inhibition, control and conditioning of instinctive responses that this imposes. Under

simple circumstances, he may react in a way that his animal nature dictates. For example, if he sees and hears a bus bearing down on him, he feels the physiological turmoil and the emotional discomfort of fear; he indulges the primitive urge to precipitous flight and, if he escapes, stands tremulous, sweating and palpitating on the curb. He has done what any other animal would have done in the face of danger. Nature is satisfied and after a brief spasm of anger and invective, he recovered his emotional and physiological equilibrium.

Primitive man responds to most threats in the same unrestrained manner. His retreat, as in the wolf, is modified or delayed only by physical interception or by a more powerful urge in another direction. For example, he will fight if cornered and he will take fantastic risks in pursuit of his mate; this is courage.

Simple, immediate threats to man's physical safety are rare in modern settings and one can seldom indulge the flight instinct. Civilization has circumvented almost all of the forces of nature and most of the physical hazards which menaced his early ancestors. Indeed, the whole object of civilization is to provide an environment in which men might feed in security and breed in comfort. Though this has been done in so far as the destructive forces of nature are concerned, man is by no means removed from the ravages of fear. In fact, a case can be made for the thesis that he suffers more and more from its effects.

With the development of civilization the sphere of each man's responsibility has broadened. Early in development he found it necessary to conform to certain lines of behaviour for the safety of his family group; later he subscribed to tribal domination and still later he has become involved in systems elaborated for the safety of his ethnic group, his race, his nation or his empire. All of these demand conformity to prescribed behaviour and imply personal restraint and denial of much instinctive and spontaneous activity. But besides these controls, dictated for physical survival, man, at all stages of development, has fabricated codes of behaviour calculated to propitiate spiritual forces and to secure survival after death.

These standards of acceptable behaviour vary with time, place and race but they may be roughly classified as moral and ethical codes, social conventions, religious and politico-social convictions. The pattern of approved behaviour has thus become exceedingly complex and man lives in constant fear of disapproval or failure; his life is a constant compromise between instinctive impulses (which are largely submerged in the unconscious) and behaviour that is legal, moral and conventional. Such controls may be necessary for the survival of communities; man quite unrestrained would destroy what we call our civilization. But that does not come into the present discussion. We are merely attempting to discover the sources of his present fears.

Further, in contrast to animals, man has two intellectual qualities that multiply and intensify his fear—memory and imagination.

By means of memory he can re-live his fears repeatedly; all the horrors of past episodes can recur and in the recurrence it frequently happens that, although the somatic effects are not marked, the emotional content is much more poignant than it was originally.

With his imagination he can conjure up all sorts of impending disaster; he can shudder in the anticipation of physical, social, economic and moral failure and cringe in the fearful prospect of Hell's fire. He is haunted by the fear of punishment ranging from the physical and temporal to the spiritual and eternal.

Furthermore, civilized man is not allowed the natural decompression of his fears by reflex activity. He must not run from a difficult situation and he cannot, except in the name of sport or patriotism, attack the object of his anger, which, indeed, is usually intangible and unrecognized. He can rarely purge his soul of venom by a vigorous and conclusive fight. In any event conflict, whether between individuals, armies or empires rarely decompresses pent up emotion. Since it does not end in the destruction of either of the participants, it often enhances the original fear and at best leaves a residuum of resentment, rancour and guilt; the momentum of the physiological turmoil is left to beat itself out against the walls of his arteries.

But that is not all. Fears, besides being retained by conscious memory and elaborated by imagination, may be stored and retained in the unconscious. According to this graphic Freudian concept, emotions which are not liquidated in the natural way, are repressed and accumulated under pressure in the unconscious. It requires very little imagination to picture the unconscious as a fearsome region, filled as it is with unconsummated passion, frustrated desire, decapitated ambition, mutilated hope, uncompensated injury, festering resentment and every other variety of unfinished emotional business. From this nether region, these repressions, under certain circumstances, and by devious routes, may escape into the realm of consciousness. Here in a distorted guise, these turbulent ghosts may produce every form of psychological aberration from bad dreams to profound psychoses.

This picture of man, sizzling over the inferno of his own unconscious and dominated by its blind and baleful influence, is, of course, too sombre and dismal, and fortunately is wrong. Repressed emotions do not usually produce neuroses, psycho-

neuroses or psychoses. Their energy may be directed into activities which are regarded as rational and are approved by society. Such "sublimation" largely accounts for the finest human efforts and much of the literature, music, art, science and other emotional and intellectual products of our era. Besides this safety valve there is other protection against being completely confounded by morbid emanations from the unconscious and by conscious frustration of instinctive drives. Man has an enormous capacity for adjustment and he has courage and a sense of humour. Also, he is capable of an astonishing capacity for mental sleight-of-hand and sophistry, or, if you like, rationalization. Often he conforms to codes for the sake of security and gives lip service to conventions even though the inner man mutters "fiddle sticks." Though many of his conflicts are quite insoluble, he is capable of developing a large degree of tolerance. Indeed, Sheldon[1] says: "The goal of education must be 'toleration, not resolution of conflict"; that is, conflict is an inevitable and constant element in all life and the battle of life is the struggle to adjust. The faculty to adjust rather than act in a purely instinctive way distinguishes man from the other animals. Browning[2] applauds as man's chief virtue his capacity to meet difficulties, when he says:

"Poor vaunt of life indeed,
Were man but formed to feed
On joy, to solely seek and find and feast:
Such feasting ended, then
As sure an end to men;
Irks care the crop-full bird? Frets
Doubt the maw-crammed beast?"

"Then welcome each rebuff
That turns earth's smoothness rough,
Each sting that bids nor sit nor stand but go!
Be our joys three parts pain!
Strive, and hold cheap the strain;
Learn, nor account the pang; dare, never grudge
the throe!"

According to this view, to have doubts and fears is man's special and divine prerogative.

1. Sheldon, Wm. H., Psychology and the Promethean Will," Harper, 1936.
2. Browning, Robt., "Rabbi ben Ezra."

## III

It is apparent that the instinct to retreat and the emotion of fear must be the normal every-day occurrences in the lives of all animals and all men. Indeed, fear is a natural and necessary shot in the arm automatically applied by nature in an emergency. Shakespeare sensed this fact when Olivia's brother advised her: "Be wary then; best safety lies in fear."

The point at which fear ceases to be physiological and becomes a pathological state must be arbitrary and depends largely on the attitude of the observer. One might say that, if signs and symptoms of fear persist long after the danger has past or are much more than would be reasonably expected under the circumstances or interfere with normal function, then an anxiety state or a neurosis exists.

A classification of the physical and psychological effects that can result are given in Chart III and IV. The groups of symptoms are divided into those that predominate in passive retreat (Chart III) and those that are more common in active retreat (Chart IV). It is not suggested that individuals who suffer from anxiety can be classified as to whether they are passive or active in their response to danger. Unfortunately, psychosomatic reactions are infinitely more complex; in most cases there is a very mixed reaction and in some it varies from time to time. All that can be said for the point of view here presented is that it has been found interesting and possibly helpful in assessing and handling anxious people. T. A. Ross, in "Common Neuroses," quotes Hart as follows:

> "An individual may react to anxiety on different occasions in different ways. One day he may react with anxiety symptoms, on another, hysterically; i.e., on one day he meets his difficulties by over action, on another by under action."

The fact that fear can be paralyzing or stimulating, of course, has been recognized by many observers throughout history. Montaigne says, "Sometimes it lends wings to the heels; sometimes it nails and shackles our feet."

**Chart III**

**RETREAT** (OBSTRUCTED)
**(Conflict, Frustration = Chronic Fear)**
**I. Passive (Characterized by Asthenia)**

| SOMATIC | PSYCHIC |
|---|---|
| Weakness and Fatigue (General) | Psychasthenia |
| Inertia | Indecision |
| Defective Vital Functions | Lack of Initiative |
| Digestion | Poor Concentration |
| Circulation | Loss of Ambition, etc. |
| Respiration | Emotional Instability |
| Locomotion | Sensitive, Seclusive |
| Special Senses | Dependent, Tearful |
| Reproduction | Sentimental, "Soft" |
| | Depressed |

Under the heading of passive escape, we see predominance of the tendency to retire and withdraw. It helps to recall these if we think of the amoeba becoming encysted and the wolf taking to earth. Asthenia and depression of function is the chief symptom of the neurotic. Usually it is worse in the morning when he is faced by another day of anxiety or frustration. It is only relieved when it is dominated by a more pleasurable emotional state. We all frequently see good examples of

this sort of fatigue. Most of us have felt it and with Hamlet have said:

"How weary, stale, flat and unprofitable
Seem to me all the uses of this world!"

Also, we have discovered that it disappears when the environment becomes more congenial and the future more promising. That this is part of a passive retreat mechanism is well exemplified by many of the people who complain of it frequently and volunteer the desire to "get away from it all."

In more profound and chronic cases this asthenia may become localized and particularly affect any of the vital systems. The digestion, circulation, respiration, locomotion, special senses or reproduction may be selected. This conversion may produce hysterical paralysis or reduced function in various organs with symptoms simulating most organic diseases. When such conversion is complete, and especially if it produces a visible and palpable disability—such as hysterical paralysis—the patient may feel psychologically safely ensconced in his shell and may become emotionally indifferent. His ego has created an effective barrier against his fears and he finds it acceptable; retreat has been accomplished and the emotional distress is likely to subside; on the surface he may apear quite pleased with himself. The complacent Mona Lisa smile of the hysteric is often seen.

Asthenia may manifest itself in the psychical sphere as psychasthenia and emotional instability.

**Chart IV**

**RETREAT**

**II. Active**

| FLIGHT | FIGHT (Anger) |
|---|---|
| Irresponsibility | Aggressive, Belligerent |
| Floaters | Hyperactive, Ambitious |
| Deserters | Over-bearing, Boastful |
| Psychopaths | Suspicious, Resentful |
| Rational Withdrawal | Critical, Sensitive |
| Compromise | Stubborn, Opinionated |
| Tolerance | Proud, Cruel, Hard |
| Restraint | |

Chart IV indicates some types of behaviour that may be seen in those who respond to fear in a more active way, i.e., by flight or fight. Flight is the invariable response in some irresponsible individuals. These are socially futile but often not unhappy people, who succeed in developing an attitude of indifference to convention; possibly some are born with this happy immunity. The second group who retire are those who do so for rational reasons. These people have insight; they realize the significance of emotions and make an effort at compromise or to adjust.

The common characteristics of those who fight rather than retire are given in the Chart. It is, of course, not suggested that any of these are abnormal tendencies. All of them and all of the symptoms and signs suggested as indicating passive retirement in Chart III are natural and normal if manifested in a suitable setting. They are only abnormal if they appear for inadequate reasons or persist after the stimulus has ceased to operate.

It is a matter of fine discrimination to judge at what point behaviour becomes pathologically aggressive or shamefully supine. This fundamental problem is well indicated in the well known supplication:

> "Dear God, give us strength to accept with serenity the things that cannot be changed; give us courage to change the things that can and should be changed; and give us wisdom to distinguish one from the other."

In our age and in our race, it seems probable that we unduly apotheosize the fighting spirit. No word in our language carries a more scathing indictment than "coward" as judged by popular opinion. No one wants to be regarded as spineless, a milk sop, an appeaser or a pacifist or to be lacking in ambition and drive. We give our greatest rewards to the bustling, somatotomic fellow who with tremendous energy spends his vigorous days pushing his environment about without much thought for anyone else or for the ultimate effect. He is the one who is forever recognizing "challenges," real and hypothetical, and whose watch word is "aggressiveness." As a consequence, there is many a psychological Don Quixote, who, in an effort to conform to this popular pattern, finds himself jousting at windmills and taking a stubborn stand in the face of hopeless odds or striving for an unattainable end. It is so often forgotten that withdrawal from danger is the instinctive and natural reaction and does not necessarily imply cowardice or moral weakness; strategic withdrawal has more merit and is more commonly indicated than is usually admitted. And it is a curious anomaly that though we give our material rewards to the egoist who muscles his way through life, we admire the less turbulent soul whose actions are marked by more passivity and whose character reflects kindness, generosity, tolerance and just compromise.

This is not a brief for indifference or for moral or physical weakness. It is merely meant to suggest that the biological manoeuvre of passive retreat may be a useful point of view in therapy. The possibility of the deliberate adoption of such a course distinguishes man from animals. Man's cerebrum confers on him the capacity of tentative activity, of choice, compromise and restraint.

## IV

It should not be thought that the recognition of the common emotions is the sole prerogative of the psychiatrist. Any medical man who is not continually absorbed in the conscious estimation of his patients' moods, and who is not acutely

sensitive to them, is missing the most productive part of diagnosis and treatment.

The clinical recognition of fear is usually not difficult. Doctors and lay people are doing it casually every day when they say to a friend: "What are you so worried about today?" or refer to someone as the "anxious type."

Such accurate inferences are made from the facial expression and general deportment. It is, indeed, from what is seen in the countenance that we derive the physical evidences of all moods. The chief function of the face (except at meal times) is to express or disguise emotion. All of us, all day long, are surrounded by faces from which we are continually receiving accurate impressions—even when the faces are silent, and all of us are unconsciously broadcasting our moods by the expressions on our faces. None of these reflections in the face are readily described in concrete terms. Few of us, without a good deal of study, could analyze the physiognomy of such divergent emotions as joy and grief—though there is no chance of confusing them when we see them.

When people are suffering from fear, the expression is serious and sombre, and perhaps the most striking fact is that they never smile spontaneously. To any playful sally on the part of the examiner, they may, in deference to good manners, respond with a brief superficial grimace. They are just as liable to consider the effort facetious and give evidence of irritation. In many anger is close to the surface. Besides this mask of depression, one is likely to get the impression of fatigue—which I shall not attempt to describe. In some the fighting mood is uppermost and one may easily arouse hostility. In these the manner may be over brisk with evidence of general tension and manic tendencies.

The various sensations produced by fear and its related emotions are legion. We will not consider the symptoms of acute fear but will review some of the common complaints of those suffering from chronic anxiety.

Feeling of fatigue and actual weakness has been mentioned and is commonly the presenting symptom.

Vaso-motor symptoms of all sorts, e.g., palpitation, flushing, hot and cold feelings, faintness, dizziness.

Gastrointestinal symptoms: Epigastric discomfort (a hollow feeling or a lump), gas belching, anorexia, irregularity of the bowels, flatulence, etc.

Nervous symptoms: Constriction in the throat, pressure in the head, restlessness, insomnia, tremor, bad dreams, headache.

Psychical symptoms: Poor memory, lack of ambition, poor concentration.

One could go on indefinitely: By self examination we may all discover our own galaxy of anxiety symptoms.

The symptoms of almost any organic disease can be simulated. It is not suggested that when one discovers these evidences of fear he should immediately make a diagnosis of a pathological neurotic state. As has been emphasized, fear is normal under many circumstances. In the presence of fear, the first problem of the physician is to determine whether or not it is appropriate to the circumstances. If there are extraneous circumstances which could reasonably account for the state of mind, the treatment is simple.

The following principles may be of value.

(1) Too often the physician is afraid to speak of fear directly but feels constrained to an oblique approach. This restraint also influences the patient. Both have a feeling that fear is a sign of weakness and something to be ashamed of and both are likely to shrink from a frank discussion. This is a mistake. Most anxious patients immediately realize that their symptoms are those of fear, when the question is put to them directly. Some will show resentment at first but this is soon dispelled by discussion. The ultimate realization of the source of their symptoms is the chief element in adjustment and the primary aim of therapy. Too often medical interviews increase the mystery surrounding the origin of symptoms.

(2) The patient should be made to understand that he is having the normal sensations under the circumstances. He has usually put all sorts of morbid interpretations to the fatigue, palpitation, epigastric distress, etc. Much will be accomplished if he can be dissuaded from this view. This device was particularly effective with soldiers who for the first time felt fear.

(3) Patients rarely realize that moods, whether good or bad, are cyclic. It is useful to point out that no emotional state—joy, grief, anger or fear—persist for long in their acute form. Patients commonly overlook this providential dispensation and often take some comfort if they are made to appreciate it.

(4) In searching for the cause of anxiety, it is useful to remember that most fears are not due to present difficulties but to those that are expected or anticipated. Freud defined anxiety as "a reaction to the perception of an external danger, of an injury that is expected or foreseen." It will commonly be found that the anticipated events have been invested with unjustified terrors—especially when it has to do with the prognosis of organic or functional disability.

(5) In looking for the cause of fear, look for something intimate and personal in the life of the patient. After realizing that the symptoms may

be due to fear, he will likely attribute it to something quite inadequate, not because he is trying to deceive but because he himself does not know the subconscious origin of his fear.

(6) If the patient is allowed to talk freely, he may disclose the source of his trouble. In any event, being allowed an opportunity to discuss his trouble before a listener who is sympathetic will frequently afford surprising relief. The examiner must carefully avoid giving the impression that he is sitting in judgment.

After seeing the patient on three or four occasions and having applied these simple principles, one can usually appreciate whether or not he has improved and whether these superficial methods are going to be adequate. If the cause of his anxiety is out of reach and he is evidently suffering from a deep and well fixed neurosis, a psychiatrist should be consulted.

This has been a very sketchy account of the biology of fear. It is by no means complete and it is not orthodox—if there is any orthodoxy in psychiatry. It has been presented in this form because from it one may better visualize the signs and symptoms of fear as one sees it in practice. And it is of the greatest importance that everyone, doctor or layman, who contacts patients should be able to recognize the signs of anxiety. In general, anxiety has too commonly been considered abnormal—especially by its victims. There is no doubt that the majority of people who ask for medical advice are suffering from more or less fear; in many it has to be looked for but in a large number it dominates the picture and accounts for the disability. The patient will rarely recognize it as fear nor call it by that name, because unfortunately, fear is commonly considered a discreditable emotion, in some way linked with cowardice. Though quite unconscious of having fear, he often uses such words as worry, anxiety, a feeling of impending trouble, depression and apprehension; these to some extent take the sting out of the word fear, but mean the same. Fear is the dominating emotion and is at the origin of most of the unpleasant and disabling neuroses.

Even hope can be associated with fear. Milton says: "So farewell hope and with hope farewell fear."* It is true that only a life completely devoid of hope can be free of fear.

### Summary

Fear is normal. It is the chief instrument by which life is preserved. It is the salutary shot in the arm automatically administered by nature in emergency. Everyone is subject to it. It is readily recognized by those who realize its importance. Its recognition and simple treatment may help to allay it and prevent serious disability.

*Paradise Lost.

# GYNECOLOGY

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## General Impressions of A Tour

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When one has spent several months visiting medical centres in thirteen different cities and three different countries, it is not possible to deal with each centre separately, nor to go into details about the various hospitals. Still less is it possible to give an adequate account of the interesting men and women encountered at institutions and at conferences. It is feasible therefore to present only a general picture. The tour was undertaken with no more definite plan than that dictated by curiosity about places and people that have been arousing my interest for years.

There are many things that are impressive as one travels about in medical circles in strange cities. The most important of these is the friendliness and courtesy with which the visiting doctor is welcomed, even without letters of introduction. In all the thirty-five hospitals visited the personnel was most helpful and courteous—from the heads of departments right down to the clerks at the information desks. In some of the larger hospitals a Resident is detailed to show the visitor the different departments. This conducted tour may take several hours if one is interested in the system of keeping records, laboratory facilities and procedures, and the routines of admission and discharge.

In New York it is particularly easy to pursue the observations of one's choice. For a nominal registration fee the New York Academy of Medicine will send a special delivery letter each evening containing lists of all ward rounds, conferences, society meetings, clinics, demonstrations and operations which are to be held at the various hospitals next day, and to which visiting doctors are welcome. With this list to hand, one can plan the day's activities according to time and geographical factors. The Massachusetts Medical Society has a similar service except that the lists are drawn on a monthly schedule which is not so satisfactory for seeing particular surgeons doing special operations. However, it gives one a plan upon which to work out the time available to the best advantage. In London the newly formed Institute of Obstetrics and Gynaecology creates a liaison between the teaching hospitals and numerous refresher courses are scheduled throughout the year, so there, too, observation and study are facilitated.

In the United States, in Britain and in Sweden, one meets the problems of hospital administration so familiar to us here. Rising costs of maintenance, falling incomes, shortages in nursing personnel, both staff and student, and lack of accommodation for patients, are universal themes of conversation and complaint. Increased expenditure for maintenance and staff salaries soars far above available hospital incomes; day rates for patients are at levels where it seems impossible for patients to occupy beds, and illness would appear to be a luxury far beyond the means of most of the afflicted. One gathers that nothing is prospering in the world of hospital administration except deficits. Under the National Health Act in Britain, the deficits fall in the lap of the Government, but are promptly passed back to the hospitals as injunctions to cut down operating expenses. These cuts must be made in such a way that there is no decrease in the service or facilities given to the patients. Thus the administration problems of Hospital Boards in Britain are extremely acute, quite apart from the delays and frustrations incident to the red tape of bureaucratic control.

The shortage of nurses is also universal, and no matter how fine a hospital is in design and equipment both the work done and the patients suffer because of the lack of nursing personnel. This has been found to be true also in those maternity hospitals which have adopted the "rooming-in" plan for mothers and babies. It was hoped that this plan would cut down the number of nurses required for the care of post-partum patients, but actually the mothers seem to require as much or more attention to allay their fears and agitations. At present, hospital budgets do not permit of increasing nurses' salaries to a more attractive level and no solution to the problem appears to be in sight. At Johns Hopkins Hospital pupil nurses are returning to other wards after their hours of duty and are being paid for these extra hours. This, after the long struggle to obtain an eight-hour day for nurses in training!

The lack of sufficient hospital beds is felt everywhere, but most acutely in Britain. The London hospitals are still in their bomb-shattered state and wards cannot be rebuilt until after the Government has completed the necessary housing projects. Under the National Health Act the demand for hospitalization has increased many fold, but the hospitals are still hampered by the inconveniences and inadequacies forced on them by war damage. One can hope that before too many years elapse the British hospitals may rival the very modern ones in the United States and Sweden which are so impressive because of tile and chromium and up-to-the-minute architecture. In the meantime one marvels that the efficiency of

the British medical world has not been appreciably lessened as a result of the exigencies with which it has been coping for the past decade. It is striking that hospital building never seems to keep pace with the need for patient accommodation: even in the centres where modern hospitals have recently been completed complaints are voiced that there are not enough beds nor space for out-patient clinics.

The initial stages of the working of the National Health Act are of great interest to the visitor to Britain. However, unless one is a medical economist with the time and training to study all the various ramifications of the Act and its operation, it is impossible to give a fair picture of the gigantic and necessary experiment that is going on. One cannot help but pick up opinions, as the medical profession is very vocal on this important subject, but, the various views are so divergent and indiscriminating that only a searching study of the actual facts could enable one to present a true picture of the pros and cons. For instance, on one hand one hears enthusiastic reports of the improved health of the pregnant women attending pre-natal clinics; this is attributed to the more equitable distribution of income, and the extra rations which are allowed these patients. On the other hand, one hears that the pre-natal clinics are falling off to a degree which jeopardizes the training of the midwives so essential to the obstetrical world of Britain. And, following on this complaint, is that of rising rates of maternal and foetal mortality and morbidity due to the fact that the private doctors, to whom the former clinic patients are now going, are obligated to make only three pre-natal examinations before confinement. This is just one example of the diametrically opposite views that confront the observer of the National Health Act in operation. Similar antithetical opinions are expressed concerning all fields of medical practice and by all grades of doctors from hospital Residents to Harley Street specialists. However, despite political leanings, one cannot help but feel that the Attlee Government is blazing a trail into the dense woods of increasing need for national assistance for those who have the misfortune to become ill, and along some such trail we shall travel no doubt in the course of time.

In the three countries visited the trend towards specialism is apparent in the training of medical students and also in the post-graduate programmes. It is startling to learn that at Johns Hopkins University and at Harvard the total time spent on the study of Anatomy is four months during the first year of college. The students admit that this leaves much to be desired as far as a general knowledge of anatomy goes, but the regional anatomy of the field in which they propose to specialize is presumably well covered while they are learning the surgery of that particular area. This system suggests that these two schools have little desire to turn out general practitioners, but there are doubtless other medical schools in the United States which are aware that the general practitioner is immensely important in the medical world. The term of hospital residency that goes into the training of candidates for specialist degrees becomes more and more prolonged and intensive. In Britain and the United States six or seven years in the same teaching hospital, after qualification, is the usual term now required by the aspiring specialist. In Sweden this very often stretches to twelve years. Current reports on the finances of universities and hospitals suggest that these institutions are in a position to supply the post-graduate students with remuneration compatible only with a life of monasticism, and it is obvious that some form of national or other subsidizing will become essential if the younger members of our profession are to enjoy any sort of home life throughout the protracted years of study.

Visiting in various Departments of Obstetrics and Gynaecology introduces one to numerous plans of organization and administration. In some centres one department embraces obstetrics, gynaecology, endocrinology and the treatment of pelvic cancer, while in other centres each one of these branches is under a separate department with what sometimes appear to be rather false dividing lines. For instance, it is curious to find abortions, ectopic pregnancies and sterilizations included in departments of obstetrics and completely divorced from the gynaecological wards. That pelvic cancer should be divided between operating-gynaecologists and irradiating-gynaecologists is perhaps more understandable. Along with the variations which one notices with regard to administration, there are also wide differences in the atmosphere of departments; these range from the rarefied academic down to the level of one big happy family. No doubt both these extremes have something to be said in their favor, but a well-balanced combination would be more desirable.

So much for general impressions. Numerous specific things interested me especially and some of these are of sufficient common interest to be mentioned briefly. The exacerbation of the differences between the surgical school and the radiological school of gynaecologists in the treatment of pelvic cancer is acute. The two factions were brought together very amicably at the Newcastle Conference on Pelvic Malignancies held the first week-end in April, and as far as British gynaecologists are concerned it appears that a return to a considered mean will be effected. However, in the Eastern States the formidable and

bloody operation of pelvic viscerectomy maintains its popularity with many surgeons and if the operative survival rate increases, no doubt some plastic procedure will be evolved to deal with the perineal hernias that develop following the evisceration. As for irradiation treatment, each centre visited had its own particular technique and dosage, all of which seemed satisfactory as the statistical results from the various methods show negligible differences. This leads one to the inevitable conclusion that the disease should be treated according to its characteristics in the individual patient rather than by rigid rules governed by tradition or antiquated applicators. The Holt Radium Institute in Manchester has a laboratory staff working with plastic materials to adapt the applicators to each individual case no matter what area of the body is involved in the disease, thus making sure that the maximum dose of radium reaches and penetrates the lesion to best advantage.

The Endocrine Clinics which I visited confirm the belief that we are only at the beginning of our knowledge of endocrinology, and paradoxes continue to appear with disconcerting frequency. By a curious coincidence, new cases of Turner's syndrome presented themselves at the Clinics of Hamblen in North Carolina, Fuller Albright in Boston, and Bishop in London while I was observing in them. Naturally enough, the Endocrine Clinics become too busy because of the channelling into them of diagnostic problems from surgeons, internists and radiologists; the wealth of material outstrips present methods of hormone assay and many of the problems remain unsolved. Investigators everywhere are endeavouring to find satisfactory methods of assay which will give more definite knowledge of hormone metabolism. Chesley at the Margaret Hague Maternity Hospital keeps a piece of placental tissue alive by perfusion with a Lindberg heart and thus collects chorionic gonadotropins direct into a beaker. This leads to interesting speculation as to future possibilities.

Infertility Clinics now occupy an important place in most hospital centres. Very often these are run in conjunction with Birth Control or Planned Parenthood Clinics. The Margaret Sanger Bureau in New York is an excellent example of the thoroughness with which infertile marriages are investigated. All possible laboratory and clinical tests are done on both partners and treatment is instituted or advised for any remediable conditions. If all other measures fail to produce a pregnancy, and if sterility is not demonstrated in the husband or wife, psychotherapy is available for either or both partners. The psychiatrist associated with the bureau began by giving group treatment and the results proved to be sufficiently promising to warrant the much more time consuming project of individual therapy. Here is another field opened up for our already over-worked psychiatrists.

Much of the surgery and many of techniques that I saw were new and interesting to me. The culdoscope in the hands of TeLinde is an intriguing instrument, despite its obvious deficiencies. To watch Wharton and a plastic surgeon construct an artificial vagina makes the procedure look relatively simple. Extra-peritoneal Caesarian section appeared more difficult of execution than the facilely written descriptions suggest, even when done by the master, Norton. The operation of pelvic viscerectomy evolved by Brunschwig is a trying ordeal lasting from three to eight hours, and one feels that it is rightly dubbed the "ante-mortem autopsy." Meigs' technique for the repair of enterocele demonstrates clearly that these herniations are usually inadequately dealt with. Heyman's method of intra-cavitary packing of radium capsules in cases of carcinoma of the uterine body must been seen to be fully assessed. The Millin Sling operation for incontinence of urine, as done by Charles Read, is obviously one that requires a good deal of experience to obtain satisfactory results. Needless to say I took the opportunity of watching Blalock do a blue-baby operation on a four-year-old boy—an exquisite piece of surgery which one can appreciate even though it is far removed from one's own field. This list of surgical highlights could go on indefinitely.

The attendance at ward rounds, Staff conferences and Medical Society meetings in the various centres was most rewarding. At these relatively informal gatherings, nuggets of information are picked up that seldom find their way into medical periodicals. Also, at such meetings well-known names become translated into personalities, thus giving added interest to one's future reading.


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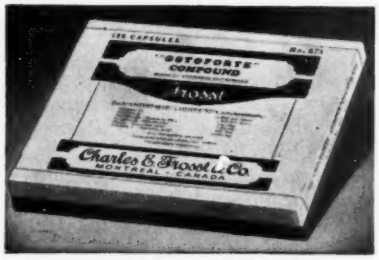


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# ANAESTHESIOLOGY

Edited by R. G. Whitehead, M.D.

## Explosion and Fire Hazards In Anaesthesia

Since, in anaesthesia, we use agents that are flammable and capable of forming explosive mixtures, it is to be expected that fires and explosions can occur. Injuries to patients and attending staff resulting therefrom range from minor burns to fatalities. Knowledge of a few basic facts and constant vigilance will go a long way in eliminating these hazards.

In anaesthesia four factors must simultaneously be present in order to have an explosion:

I. Oxygen.

II. Combustible gases and vapors.

III. Explosive mixtures of I and II.

IV. Ignition source.

Let us consider these separately.

I. Oxygen—In anaesthesia, it is supplied pure, in air or in chemical combination with nitrogen in nitrous oxide.

II and III. The accompanying table[1] lists the agents, gives their density relative to air and limits of flammability in air, oxygen and nitrous oxide.

**Limits of Flammability of Anaesthetics**

| | Density air | Limits of flammability | | | | | |
|---|---|---|---|---|---|---|---|
| | | In air | | In oxygen | | In nitrous oxide | |
| Anaesthetic | 1 | Low | Up | Low | Up | Low | Up |
| Ethylene | 0.97 | 3.05 | 28.6 | 2.90 | 79.9 | 1.90 | 40.2 |
| Propylene | 1.45 | 2.00 | 11.1 | 2.10 | 52.8 | 1.45 | 28.8 |
| Cyclopropane | 1.45 | 2.40 | 10.3 | 2.48 | 60.0 | 1.60 | 30.3 |
| Ethyl chloride | 2.23 | 4.00 | 14.8 | 4.05 | 67.2 | 2.10 | 32.8 |
| Ether-divinyl | 2.42 | 1.70 | 27.0 | 1.85 | 85.5 | 1.40 | 24.8 |
| Ether-diethyl | 2.56 | 1.85 | 36.5 | 2.10 | 82.0 | 1.50 | 24.2 |
| Nitrous oxide | 1.52 | Not flammable | | Not flammable | | | |
| Chloroform | 4.12 | Not flammable | | Not flammable | | | |

From the above it is seen that the limits of flammability or explosibility are well within the range used in anaesthesia. Use of pure oxygen more than doubles the range of flammability of all agents. It also increases the explosive violence of some agents. Before the advent of the use of oxygen with ether, the fires were usually not fatal to the patient. Ether in air burns so slowly that the flame is not propagated into the lungs. With oxygen as the atmosphere in which the ether vapor is carried, the rapidity of flame propagation into the lungs is sufficient to burst the lungs almost at the instant of ignition at the anaesthetic mask. Some are under the impression that cyclopropane is the most explosive of anaesthetic gases. Certain mixtures of ether-oxygen-nitrous oxide can be more dangerous than any cyclopropane-oxygen combination. Ethylene mixed with nitrous oxide is highly explosive. The proper mixture of these gases under high pressure, if ignited will explode with terrific violence. With any apparatus the nitrous oxide cylinder should never be opened at the same time as the ethylene nor should an ethylene anaesthesia be preceded by a nitrous-oxide induction.

Attempts have been made to eliminate the explosion hazard of combustible gaseous mixtures by controlling their oxygen contents by dilution with inert gases[2]. Some of the inert gases investigated were helium, nitrogen and carbon dioxide. Of the three, helium appears to be the most promising. For those interested, more information can be obtained from reference (2).

IV. Ignition source—

(a) Open flames such as might be provided by alcohol lamps, bunsen burners, matches or smoking. These should definitely be prohibited in operating rooms and in other rooms where anaesthetics are administered or kept.

(b) Use of cautery or diathermy apparatus. These can ignite any combustible anaesthetic mixture. The active electrode of surgical diathermy presents the very same hazard as the hot cautery tip. Many writers flatly object to any use of cautery or diathermy in presence of combustible agents; they maintain that spinals or other regional blocks, nitrous oxide, intravenous barbiturates or rectal basal anaesthesia or combinations of two or more of these should provide a wide enough choice. However, there are times when cautery or diathermy are used in presence of flammable agents. So, one author who has spent much time studying this subject has formulated what he considers the safest and most practical set of principles governing the use of cautery in the operating room[3]. The following are some of his suggestions:

1. The anaesthetist should specifically enquire before starting the anaesthesia as to the possible use of cautery.

2. If the cautery must be used on or in the head, neck, shoulder, chest, respiratory passages or pleural cavity, the anaesthetic must be of a non-combustible type. The use of chloroform is to be avoided because it is decomposed by heat to form irritating fumes.

3. If the cautery must be used in the abdomen, pelvis, perineum, lumbar back, lower extremities or distal parts of upper extremities, the anaesthetic of choice should be a non-combustible type provided it is as safe from all other viewpoints, for the patient as would be the combustible inhalation anaesthetic that would have been chosen had the surgeon not used cautery.

4. If cautery is used in regions listed in 3 with combustible anaesthetic, then the following conditions should exist before cautery is switched on:

(i) **A meticulously closed** circuit method of administration should have been in use for the previous ten minutes.

(ii) The combustible anaesthetic of choice is ether-air by closed circuit administration because of its lesser tendency toward propagation and lesser range of explosibility as compared with ether, ethylene or cyclopropane mixtures with high concentrations of oxygen or nitrous oxide.

(iii) The patient should be securely set in third stage of anaesthesia to be certain that no vomiting occurs to break the closed circuit during the period of cauterization.

(iv) No part of the cautery should be near the anaesthetic apparatus.

(v) A draped screen should be placed so that it will intervene between the head of the patient and the field of operation.

(vi) If a cautery is to be used in or on a hollow viscus such as stomach or bladder, the viscus should be emptied of gaseous content before cautery is applied.

It is worth while mentioning here, fires may be caused by the application of cautery to surgical fields prepared with ethylchloride spray anaesthesia or with skin cleaners like ether or alcohol or with skin antiseptics like various tinctures.

(c) Sparking — A spark accompanies every operation of a switch in a circuit which is carrying a current. A spark also results from the withdrawal or insertion of an attachment plug at an outlet. In addition to the sparks which accompany the normal use of electrical circuits sparks may result from defect in the electrical equipment. Electrical equipment commonly used in the operating room are cautery, diathermy, X-ray machines, endoscopic and accessory lighting apparatus, motor driven pressure-suction apparatus, bone saws and drills and electrical outlets and switches inside the room. A method approved for preventing the sparks from causing explosions is to enclose those portions of the circuit at which sparks may occur. The objective of so-called "explosion-proof" fittings is not to keep flammable gases from reaching the spark but to segregate any such gas in which combustion may start so that it shall not extend to the outside atmosphere. Explosion proof fittings should be installed not only at the wall outlet but everywhere the circuit may be opened on electrical equipment. All electrical equipment used in the operating room should be of approved design and construction and should be examined and tested at intervals. Routine examinations of insulation resistance should be made at frequent intervals. Manufacturers of X-ray equipment state that although it is possible to develop equipment that would be spark proof under all circumstances, very few, if any of the shock-proof diagnostic X-ray outfits used are completely shock-proof, and, that the closed method of administration of a combustible agent does not make anaesthesia completely safe from ignition by sparks generated during the use of X-ray equipment[4]. The same is true in the use of diathermy apparatus; the prevention of all sparks is impossible.

Another very important ignition source is sparking due to discharge of static electricity. It does not take a heavy spark to cause an explosion or fire when using combustible anaesthetic mixtures. Recent investigation has shown that the amount of electrical energy required in a static spark to ignite various hydrocarbon and anaesthetic gases when these are mixed in certain proportions with oxygen can be as low as two-thousandths of a millijoule or approximately five-millionths of a gram-calorie. Such a spark may be no longer than one sixty-fourth of an inch—totally invisible and scarcely perceptible. If accumulated on an insulated conductor, the amount of electricity produced by a comb through the hair, or rubbing a small sheet of paper or fabric with a dry hand is more than sufficient to produce a spark of required energy[5]. Static charges can accumulate only on insulators or insulated conductors.. A spark between two bodies can occur only when there is no electrical path of good conduction between them. Methods used to control static electricity are based on prevention of production of static charges whenever possible and on providing pathways for these charges, when formed, to reach ground potential without production of sparks. The first step against accumulation of static changes is to keep insulating materials out of the operating rooms. No woollen, silk, rayon or shark skin outer garments should be worn in the operating room by any person. Shoes with soles and heels of rubber or artificial substitutes are not only good insulators but good generators of static electricity. Woollen blankets should not be used. Conductive rubberized cloth should be employed for operating room tables, mattress covers and pollow covers. Rubber casters, rubber tired wheels, rubber crutch tips on operating room furniture, rubber tubing face masks and breathing bags of anaesthesia apparatus should be made of conductive rubber. Most terrazzo floors are sufficiently conductive. Wood and linoleum floors especially if waxed are entirely unsafe. Tile floors become good conductors when mopped with 4% calcium chloride. Next is to keep the relative humidity in the operating room at a high enough level; the desired range is over 55%. A dry atmosphere is very conducive to production of static electricity. The general impression is that accidents are more common during seasons of the year in which the operating room relative humidity is below the desired level.

To avoid conditions leading to the discharge of static sparks it is necessary to have all objects and people in the operating room at the same

electrical potential. In other words it means that everything and everyone should be grounded since some of the operating room equipment is at ground potential, e.g., the plumbing and heating systems or floors if conductive. Where the floors are conductive grounding chains attached on tables, stools, carriages, gas machines, etc., are useful. The ideal shoe for wear is one having a sole of the same conductive rubber as that developed for flooring. Leather soles are fair conductors especially if moistened occasionally. With high resistant floors direct grounding or use of high resistance intercoupling for a limited group of objects or individuals with grounding has been recommended, but the use of intercouplers or other means to avoid discharge of static sparks may be an added hazard unless constant vigilance is applied to the proper technique of their use and the control of all other related factors.

In using anaesthetic gases under high pressure, care must be taken to release pressure slowly otherwise sudden release of a higher compressed gas may cause an explosion. Another type of high pressure accident may result from passage of oxygen at high speed over combustible material such as oil or a leather washer in the anaesthetic circuit. Valves on gas machines should not be oiled.

In 1937 the American Society of Anaesthetists appointed a committee for the study of the hazard of fire and explosion[6]. Below are some of the tables from the comprehensive report of the case findings of this committee.

**Table 1**

**Fires and Explosions Grouped as to Etiology**

| | | |
|---|---|---|
| 1. | X-ray apparatus | 10 cases |
| 2. | Cautery apparatus | 57 " |
| 3. | Diathermy apparatus | 20 " |
| 4. | Suction-pressure machines | 59 " |
| 5. | Endoscopic apparatus | 5 " |
| 6. | High pressure explosions | 10 " |
| 7. | Static electricity | 63 " |
| 8. | Miscellaneous | 6 " |
| | | 230 " |

**Table 6**

**Source of Ignition — Cautery or Flame**

| | Total No. of Cases | Cautery or Flame Used Near Head, Neck, Chest, Etc. | | | Cautery or Flame Used in Abdomen or Elsewhere | | |
|---|---|---|---|---|---|---|---|
| | | Cases | Deaths | Injuries | Cases | Deaths | Injuries |
| Ether-air | 14 | 5 | 1 | 3 | 2 | 0 | 2 |
| Ether-$O_2$ (c or s $N_2O$) | 17 | 7 | 4 | 5 | 5 | 0 | 2 |
| Ether-air or $O_2$ | 6 | (one patient died — classification not possible for want of details of explosion) | | | | | |
| Ethylene | 9 | 6 | 5 | 4 | 2 | 0 | 3 |
| Ether or Ethylene or both | 1 | 1 | 1 | | | | |
| Ethyl chloride | 3 | | | | 3 | 0 | 2 |
| Acetylene | 3 | | | | 2 | 0 | 2 |
| Cyclopropane | 2 | (one patient died — classification not possible for want of details of explosion) | | | | | |
| Alcohol | 2 | 1 | 0 | 1 | 1 | 0 | 1 |
| | 57 | | | | | | |

**Table 7**

**Source of Ignition — Diathermy Apparatus**

| Agent | No. of Cases | Injuries |
|---|---|---|
| Ether-air | 3 | No injuries. |
| Ether-$O_2$ (c or s $N_2O$) | 9 | 2 patients died.<br>1 patient and 3 bystanders seriously injured.<br>1 patient and 2 bystanders slightly injured. |
| Nitrous oxide-oxygen mixed with an unknown combustible agent | | seriously injured a patient. |
| Ethylene-oxygen | 2 | 1 patient died.<br>1 patient suffered a ruptured bladder but recovered. |
| Cyclopropane-oxygen | 2 | 1 patient died. |
| Surgical field fires: | | |
| Alcohol | 2 | 1 patient died. |
| Ether | 1 | Patient died. |
| | 20 | 6 patients died. |

**Table 12**

**Source of Ignition — Static Electricity**

| Agent | No. of Cases | Injuries | Deaths |
|---|---|---|---|
| Ether-air | 2 | None | None |
| Ether-$O_2$ (c or s $N_2O$) | 21 | 1 patient — ruptured lung with recovery<br>7 patients injured<br>7 other persons | 3 patients<br>1 anaesthetist |
| Ethylene-$O_2$ | 25 | 2 patients<br>6 other persons | 3 patients |
| Cyclopropane-$O_2$ | 15 | 4 patients — 2 recovered from ruptured lungs<br>7 other persons | 7 patients |
| | 63 | | |

The tables are included here just for illustration of what may happen if we are careless or ignore the known facts about the cause of these accidents. To rely upon a single defense or precautionary measure if more are available is unjustified. The occurrence of accidents result when a number of events coincide. To reduce the frequency of occurrence of a single group of these events is to reduce by a large factor the probability of an undesired coincidence. To reduce the frequency of two or more such groups is to reduce the probability by the product of the factors of the individual groups. The conclusion of the Committee mentioned above was that "our present day knowledge of the etiology and prophylaxis of all anaesthetic fires and explosions is sufficient to prevent all further anaesthetic combustions."

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I. A. Phaneuf, M.D.

## Opportunities for Medical Practice

Through the combined office facilities of the College of Physicians and Surgeons of Manitoba and the Manitoba Medical Association (Canadian Medical Association, Manitoba Division) efforts are constantly being made to bring POSITION WANTED—HELP WANTED—LOCUM TENENS advertisers together. Several good openings for Locum Tenens, Contract Practice, Assistantship, Municipal Doctor Contract, Part-time employment and Private Practice are available, and details may be obtained through the Executive Secretary-Registrar at 604 Medical Arts Building.



## College of Physicians and Surgeons

The Annual Meeting of the Council of licensing body was held on the afternoon of Wednesday, October 19th, in the Board Room, Manitoba Medical College.

The following constitute Council:

| | |
|---|---|
| Brandon | Dr. F. K. Purdie, Griswold |
| Dauphin and Nelson | Dr. C. S. Crawford, The Pas |
| Lisgar | Dr. C. W. Wiebe, Winkler |
| Macdonald | Dr. A. L. Paine, Ninette |
| Marquette | Dr. T. W. Shaw, Russell |
| Neepawa | Dr. J. S. Poole, Neepawa |
| Portage la Prairie | Dr. A. A. Alford, Oakville |
| Provencher, Springfield and St. Boniface | Dr. H. Guyot, St. Boniface |
| Selkirk | Dr. Edward Johnson, Selkirk |
| Souris | Dr. W. Malyska, Waskada |
| Center Winnipeg | Drs. W. J. Boyd, T. H. Williams |
| North Winnipeg | Drs. B. Dyma, I. Pearlman |
| South Winnipeg | Drs. C. E. Corrigan, C. B. Stewart |

Elected as oficers for the ensuing year were:

| | |
|---|---|
| President | Dr. Edward Johnson |
| Vice-President | Dr. I. Pearlman |
| Registrar | Dr. M. T. Macfarland |
| Treasurer | Dr. T. H. Williams |

Dr. Edward Johnson is a graduate in Medicine of the University of Manitoba, who received his diplomas in 1928 and his L.M.C.C. qualification the same year. He is certified with the Royal College of Physicians and Surgeons in Psychiatry and is Medical Superintendent of the Hospital for Mental Diseases, Selkirk. Dr. Johnson is married, and a family man. He has been active in medical circles and community projects.

### Secretary Wanted

Medical graduate as permanent secretary, New Brunswick Division C.M.A. Applications confidential. State qualifications, experience and salary expected. Dr. R. A. H. Mackeen, New Brunswick Bureau of Laboratories, Saint John, N.B.

# EDITORIAL

J. C. Hossack, M.D., C.M. (Man.), Editor

## Merry Christmas

Time passes so quickly that it seems only yesterday that we were wishing each other a Merry Christmas, yet Christmas itself seems to last even less than a day—no longer is it a season. Centuries ago, when life moved leisurely, Horace complained of the bustle of his time, and so has it been in every century since, and so is it even now when one's thoughts travel back through the years.

Do you remember when the streets as well as the house-tops kept the whiteness of the snow, when little birds not yet deceived by flatulent motor cars gleefully watched the passing of feculent horses and remained plump all winter, and when these same horses made the season lively with the cheery jingling of the bells?

And then there were the carol singers—little groups of little people—whose childish trebles sweetened the air as they sang of Good King Wenceslas and of Watching Sheperds and of singing angels and of the humble yet proud ushering in of an era. The little children, having earned their guerdon, did not stay long but moved from house to house leaving at each the lingering echoes of their songs and a wish to hear them more.

But alas, old times are changed, old manners gone. The streets are black, the jingling bells are silent, roaring motors leave no night silence and disc jockeys make carols almost unholy. For a few weeks (as long as we can endure it) every radio every hour will blare forth carols mixed with murders and the voices of shriekey women and wailing men, and the fantastic indecencies of the soap operas. O tempora, O mores. It is fortunate that Good King Wenceslas is dead for shortly his virtues will be blasted into our ears almost twenty-four hours a day until the poor monarch himself (could he hear them) would gladly seek entombment and heartily regret the deed that made him famous.

Yet, despite all this, at no season are we closer to the Golden Age. Then we think of others and especially of those whose Christmasses are no longer merry. To them we give our of our fullness, scarce noting the amount. But in our giving we may forget that no one is immune to misfortune—not even those of our own calling and their wives and widows and children.

It was for them that the Benevolent Fund was established and must be maintained. Already help has been given from it but the Fund is small. Remember it now in this "season for kindling the fire of hospitality in the hall, and the genial fire of charity in the heart." "I will honour Christmas in my heart," said Charles Dickens "and try to keep it all the year." Here is a way in which you can keep it all the year. The treasurer is Pat McNulty.

## Winnipeg Medical Society—Notice Board

It is time to once again dust off the cobwebs from the Notice Board. Since last you saw it the Society has acquired a new set of officers and has already had three meetings.

So far our President has been calling chiefly upon his titled friends to be our speakers. First it was Sir Lionel Whitby the eminent haematologist and then Sir John Parkinson the distinguished cardiologist. In December you will be given an opportunity to hear Sir Heneage Ogilvie of London, England.

On this occasion Sir Heneage will have before him as he speaks something that will, I am sure, touch him closely for our gavel is made from a seared fragment of the Hunterian Museum. Many of the newer members may not be familiar with its story and for them I tell it now.

During the session that I had the honour to be your President we had as speaker on one occasion Mr. (then Surgeon Rear-Admiral) Gordon Gordon-Taylor. I sked him if he would be good enough to obtain for us a fragment of the blitzed museums. In due time it arrived as a gift from the Royal College of Surgeons and part of it was made into a gavel. It came in those black days that were the nadir of our hopes. Singapore had fallen and Alamein had yet to fall. The fires in which Hitler hoped to consume an Empire were welding its members together even more strongly. Then, at each meeting, one could see in his minds' eye the ruins from which our gavel had been plucked and the bond between ourselves and our colleagues overseas seemed to grow stronger. Now, in times of peace, it is still a symbol of our unity and is, moreover, a reminder of the wasteful tragedy of war.

Never before in its history has the Society been so strong in numbers. Now there are 454 members —far too many to find accommodation in Theatre

A. In a way, therefore, it seems a bit foolish to whet your appetites by giving publicity to the programmes. But, of course, if members cannot find seats they will complain and our President, Dr. Holland, is in a way hoping that they will complain, and, having done so, will go a step further and insist upon adequate accommodation. This would mean finding an auditorium. At present there is none easily or inexpensively available. It follows, then, that an auditorium will have to be built. The College itself has much need of one and perhaps the University will build it.

It has, however, been suggested that we might follow the lead of other cities in having a building of our own in which would be housed not only the officers of the Society but also those of the Association, the C.P.S., the Medical Service and so on. In time, no doubt, the matter will be brought up for discussion. For the present you are reminded that Sir Heneage Ogilvie will speak on Friday, December 16th, in Theatre A at the Medical College. His topic, "Acid Secretion in Relation to Peptic Ulcer" and you are advised to go early if you want a seat.

J. C. H.

# ASSOCIATION PAGE

Reported by M. T. Macfarland, M.D.

## The Annual Meeting, September 20, 21, 22, 1949

The 42nd Annual Meeting of the Association was held on the above dates at the Royal Alexandra Hotel, Winnipeg. The appreciation of the President, Dr. H. S. Evans, and members of the Executive Committee, is extended to the Chairman and members of each Committee, and to the members of the Association who were responsible for the measure of success obtained in the carrying out of this annual event.

Guests of the Association for the meeting were members of the Canadian Medical Association Executive Committee, headed by the President, Dr. J. F. C. Anderson of Saskatoon, and Dr. T. C. Routley, General Secretary, Toronto. Each of these gentlemen sat in with the Executive Committee, spoke at one of the noon luncheons, and attended the afternoon business session on September 21st. Dr. J. Wallace Graham, Toronto, President, National Board of Directors, Canadian Arthritis and Rheumatism Society; Dr. N. W. Philpott, Montreal, Department of Obstetrics and Gynaecology, Royal Victoria Hospital, and Dr. T. A. Watson, Saskatoon, Clinical Director, Saskatchewan Cancer Commission, were the special guest speakers. The time of all guests was divided with the Alberta Division. Full use was made of them on the first two days of the convention and their contribution was indeed greatly appreciated. It is a matter of regret that the papers are not available for reproduction in the Review, since they will probably appear in the Canadian Medical Association Journal.

Registration at the Convention, including City Members, Rural Members, Guests and Visitors, Students and Internes and non-registered doctors made a total of 461. Attendance at the sessions varied considerably, and that, at both noon luncheons and the business sessions on Wednesday afternoon and evening, left much to be desired. A lighter lunch at a more moderate price might have resulted in better attendance at the luncheon, but the small turnout for the yearly meeting at which the business of the Association is considered, reflects profound apathy of members or demonstrates the confidence which members have in their elected officers and other members of the Executive Committee to carry on the affairs of the Association as a whole.

Scientific sessions were held in the Crystal Ball Room of the hotel on Tuesday morning and afternoon, also Thursday afternoon, while clinical sessions were held at two of the teaching hospitals on the morning of Wednesday and Thursday. Scientific Exhibits were more numerous, of better quality, and occupied larger space afforded by the Colonial Ball Room. The Commercial Exhibits, which add much to the success of any similar gathering, occupied the Banquet Hall. A new and interesting type of badge symbol requiring color code interpretation was a feature of 1949.

Social events were divided between those officially listed and ones not included in the programme. A tea, arranged by the Ladies Committee under the Chairmanship of Mrs. H. S. Evans, was held at the University Women's Club. The Annual Golf Tournament was staged at the Southwood Course under the Chairmanship of Dr. E. W. Pickard when winners were: Dr. A. G. Little, low net; Dr. A. D. Bracken, low gross, and Dr. F. Fjeldsted, hidden hole. At the Annual Reception-Dinner-Dance there was a good attendance. Musical programme was provided by Mr. Kerr Wilson, concert soloist, and party which included trio and accordionist. The past-president's certificate was presented to Dr. R. W. Richardson, and the new president, Dr. D. L. Scott, was presented to the gathering. A toast to the Ladies, proposed by Dr. F. K. Purdie, Griswold, and responded to by Mrs. "Bud" McDiarmid of Brandon, was greatly enjoyed by the listeners.

### Officers of the Association

The following officers were elected by ballot at the Annual Meeting:

President.....Dr. D. L. Scott, Winnipeg
Vice-President.....Dr. Eyjolfur Johnson, Selkirk
Hon. Sec.....Dr. C. B. Schoemperlen, Winnipeg
Hon. Treas.....Dr. R. Lyons, Winnipeg
Member-at-large—
Rural.....Dr. C. W. Wiebe, Winkler
Urban.....Dr. W. F. Tisdale, Winnipeg

These names and those of the District Medical Society representatives, and other bodies appear on the inner page of the Review.

### Executive Committee

At the meeting of the outgoing and incoming Executive Committees on Thursday, October 13th, Dr. H. S. Evans passed the gavel of office to Dr. D. L. Scott. Present for the meeting in addition to members were the Association representatives to the Cancer Relief and Research Institute, also representatives of the Association to the committee in charge of the conduct of the Crippled Children survey which is being carried out in this Province as one project of the Federal Health Grants.

## Group Insurance

December 29th is the renewal date for policies which were taken out at the inception of this group coverage against Sickness and Accident by members of the Association. Inasmuch as continuation of coverage afforded by this agreement is dependent on fifty per cent membership of the Association, the co-operation of all members is requested. New members of the Association may, in the initial thirty-day period following acceptance of membership, secure coverage without producing medical evidence of insurability. Members who held policies prior to moving to another Canadian province may secure non-resident membership for a nominal fee which will enable them to continue the policy of Sickness and Accident coverage providing they are members of the Provincial Medical Association of the province in which they locate.

## Northwest District Medical Society

The fall meeting of the Northwest District Medical Society was held on the afternoon of Wednesday, November 2nd, at the Sacred Heart Hospital, Russell, Manitoba.

Present were Doctors S. Bardal, Shoal Lake; D. Braunstein, Binscarth; T. I. Brownlee and T. W. Shaw, Russell; M. Cham, Rossburn; A. W. Hicks and W. A. Large, Roblin; E. D. Hudson and J. E. Hudson, Hamiota; J. P. McManus, Langenburg, Sask.; W. J. Sharman, Angusville; A. T. Gowron, B. E. Loadman, E. H. Whelpley and M. T. Macfarland, Winnipeg.

The minutes of the last regular meeting were read by the Secretary-Treasurer, Dr. J. E. Hudson, and were accepted by the meeting.

Election of officers for the ensuing year resulted as follows:

President—
Dr. D. Braunstein, Binscarth.
Vice-President—
Dr. W. A. Large, Roblin.
Secretary-Treasurer—
Dr. J. E. Hudson, Hamiota.
Representative to Executive Committee, M.M.A.—
Dr. J. E. Hudson.
Public Relations Representatives—
Dr. E. D. Hudson, Hamiota.
Dr. T. W. Shaw, Russell.

Dr. B. E. Loadman spoke on "Ruptured Intervertebral Disc," illustrated by lantern slides and Dr. A. T. Gowron discussed the formation of the Manitoba Medical Service, tracing the development to the present time, when extension to the whole province is contemplated. A brisk discussion followed.

Dr. E. H. Whelpley, Department of Veterans' Affairs, brought greetings to the meeting, and the Executive Secretary of the Association gave highlights of the recent Annual Meeting of that body, including the report on the Health Services Act, Public Relations, establishment of Cancer Diagnostic Clinics, and extension of the Manitoba Medical Service.

Refreshments were served during the afternoon at the hospital, and about thirty guests sat down to dinner at the Queen's Hotel. The evening Chairman was a veteran practitioner of rural Manitoba, Doctor E. D. Hudson. Dr. A. W. Hicks of Roblin, reported having travelled east via the Great Lakes Steamer "Noronic," which, two days later, was turned into a blazing inferno.

It is hoped that meetings of the Northwest District Medical Society for the year 1949-1950 may be held more frequently. The suggestion was made that some arrangement of meeting dates for all District Medical Societies to prevent overlapping might well be discussed by the Executive Committee of the Association.

## Northern District Medical Society

A meeting of the Northern District Medical Society was held on the afternoon of Wednesday, November 9th.

Present were Doctors R. E. Dicks, Dauphin, Chairman; R. M. Creighton, A. S. Little, M. Potoski and W. G. D. Ritchie, Dauphin; Wm. Bashucky, Winnipegosis; A. W. Hicks Roblin; T. F. Malcolm, Swan River; L. R. Coke, D. L. Scott and K. R. Trueman, Winnipeg.

Following reception and visit to the provincial unit, which houses the Local Health Unit and the

Diagnostic Unit, and inspection of the hospital, members and visitors were partakers of a banquet, provided by the matron of the hospital and her capable assistants.

Dr. L. R. Coke, Winnipeg, spoke on "Complications of Coronary Disease," and Dr. K. R. Trueman spoke on "Surgical Conditions of the Anus and Rectum." Each talk was illustrated with lantern slides.

Dr. D. L. Scott, President of the Association, made an official visit to the Society, and considerable discussion ensued concerning matters which were discussed at the Annual Meeting of the Association; one such being the manner in which the carrying out of the Manitoba Health Services Plan has affected the status of the practitioner in the Dauphin area, and extension of Manitoba Medical Service.

Officers were elected for the ensuing year.

Representative to M.M.A. Executive, Dr. M. Potoski.

The Society greatly appreciates the co-operation offered by the Matron of the Dauphin Hospital, Miss A. Pearson, and her associates.

## Brandon and District Medical Association

The fall meeting of the Brandon and District Medical Association was held in the Legion Hall, Neepawa, on the afternoon of Wednesday, November 16th.

Present were Doctors A. M. Clare (President), W. A. Howden, M. K. Pierce, J. S. Poole and Wm. Watt, Neepawa; E. S. Bolton, Kelly Chu, Michael Duggan, Dr. and Mrs. G. B. Elliott, H. S. Evans, J. A. Findlay (Vice-President), R. F. M. Myers, S. J. S. Peirce, A. H. Povah, F. J. E. Purdie (Secretary), and V. J. H. Sharpe, Brandon; G. J. Smith and Chas. E. Acheson, Gladstone; F. K. Purdie, Griswold; F. C. Wilson, Melita; J. N. Andrews and H. C. Stevenson, Minnedosa; R. T. Watkins, McCreary; A. V. Jubb, MacGregor; Robert Kippen, Newdale; H. S. Atkinson and G. H. Hamlin, Portage la Prairie; Leon Rubin, Rivers; Major G. G. Lippert, Shilo Camp; J. P. Gemmell, A. Hollenberg, Murray McLandress and M. T. Macfarland of Winnipeg.

The minutes of the last informal meeting of the Society had been circularized to members over the signature of the President with the notice and programme for the present meeting. Since they had been referred to on many occasions they were taken as read.

The Scientific Programme consisted of the following papers:

Dr. Murray McLandress, Winnipeg, "Problems in Premature and Infant Feeding."

Dr. A. Hollenberg, Winnipeg, "Recent Work in Experimental Diabetes."

Dr. J. P. Gemmell, Winnipeg, "Radio Active Isotopes."

Following the social hour provided by the Neepawa medical profession, a banquet was provided under the sponsorship of the Legion Ladies' Auxiliary. Dr. H. O. McDiarmid was unable to attend and Dr. J. S. Poole spoke briefly in his own inimitable manner. The various guests were introduced to the gathering, including Dr. J. B. Rollit, Assistant to the President, University of Manitoba. A vote of thanks was extended on behalf of the meeting by Dr. F. K. Purdie to the Neepawa medical profession, to the Ladies' Committee under Miss Olive Dennison, R.N., Matron, Neepawa General Hospital, and Miss Jean Heighton, R.N., Neepawa Health Unit, and the wives of local doctors for the entertainment provided.

A public evening meeting sponsored by the Neepawa Chamber of Commerce was chaired by Dr. J. S. Poole in the absence of Mayor Cleave. The speakers were Dr. J. B. Rollit, "The University and the Community," and Dr. A. Hollenberg, "Provision of Medical Care." Dr. Wm. Watt, Medical Health Officer and Mr. T. Johnson, Sanitary Inspector, Neepawa Health Unit, provided two medical films.

## Clinical Luncheons and Meetings, December, 1949

First Thursday, December 1st, 1949,
Winnipeg General Hospital.
First Friday, December 2nd, 1949,
Children's Hospital.
First Tuesday, December 6th, 1949,
King Edward Hospital.
Second Thursday, December 8th, 1949,
St. Boniface Hospital.
Second Friday, December 9th, 1949,
Victoria Hospital.
Second Tuesday, December 13th, 1949,
Misericordia Hospital.
Third Thursday, December 15th, 1949,
Winnipeg General Hospital.
Third Thursday, December 15th, 1949,
St. Boniface Sanatorium—evening meeting.
Third Tuesday, December 20th, 1949,
Grace Hospital.
Fourth Thursday, December 22nd, 1949,
St. Boniface Hospital.
Fourth Tuesday, December 27th, 1949,
St. Joseph's Hospital.
Fourth Wednesday, December 28th, 1949,
Deer Lodge Hospital—evening meeting.

(In cases where the Christmas season may interfere with dates it would be advisable to contact the hospital concerned).

# SOCIAL NEWS

Reported by K. Borthwick-Leslie, M.D.

The Season's Greetings, Peace on Earth and all that—May I once more and this time publicly in the "Gossip" column, tender my resignation.

♦

Yes, I was late last month and I apologized. The printer hadn't time to submit proofs for me to correct but when I get jumped on with "Did you ever learn to read?" "Who in— does your proof-reading?" from one side and simultaneously from the other side, or "after all, I was away last summer, did you mention that?" "Aren't you supposed to be a reporter?" and so on, so on, ad infinitum, I wonder just why those who are so ready to criticize are the ones who never give a helping hand. If said people haven't time to drop me a chit as to their activities, heaven knows I haven't the time to travel from office to office digging up gossip. It is such a simple matter to drop a note to this column and every bit of news is appreciated.

Happy New Year to our readers and "Good Bye." Thank you very much for the grand co-operation of those who do co-operate and to Gordon for both his patience and help.

♦

Dr. H. P. Saunders, Chicago, Associate Director of the American College of Surgeons, has been in Winnipeg, arranging for a regional meeting of the College, April 3rd and 4th. A special committee—Dr. G. S. Fahrni, chairman; Dr. O. S. Waugh, vice-chairman, and Dr. P. H. T. Thorlakson, secretary, conferred with Dr. Saunders. This should be a most important and instructive meeting.

♦

Having completed a three-year P.G. course in Dermatology in Minneapolis, Dr. Harold Hurst, with Mrs. Hurst and daughter Susan, returned to Winnipeg.

♦

Dr. M. Merle Patterson '42, on furlough from Branswara, Central India, where for five years she has been Medical Supt. of the Hospital and Nurses' Training School.

♦

Dr. Donald M. Jackson, '49, is enjoying immensely his P.G. work in Surgery in Exeter, Eng.

♦

Joseph A. Ludwig, M.R.C.S., L.R.C.P., M.S., D.D.S., announces the opening of his office, 514 Boyd Building, for the practice of Plastic Surgery and Oral Surgery.

Dr. Margaret Pratt (Schuerch) '45, having recently completed an extensive P.G. course in Anaesthesiology at McGill, is now living in Syracuse, N.Y., where her husband, Dr. Conrad Schuerch, is with the Dept. of Chemistry, New York College. They have one daughter, Barbara Ann.

♦

Dr. D. K. Merkeley has been appointed pathologist for the R.C.M.P. Crime Detection Laboratory, Regina, Sask. Norm tells me he is known as "Sherlock" Merkeley.

♦

Dr. and Mrs. Avard Fryer with daughter Ava Margaret, have returned to their home in Fort William, after visiting with Dr. and Mrs. I. O. Fryer.

♦

Mrs. C. E. Chown announces the engagement of her only daughter, Mabel Alison, to Dr. James Bert Cosgrove, Cambridge, Eng. The wedding will take place December 3rd in Holy Trinity Church, London, Eng.

♦

Dr. and Mrs. Cecil W. Clarke announce the birth of Douglas Maclean, November 12th. Congratulations—is Cecil the proud Daddy!

♦

Dr. and Mrs. Donald McPhail, Boissevain, Man., announce the arrival of Shirley Anne, on Nov. 24th.

♦

May I extend my personal sympathy as well as that of the Review to Dr. Alex Swan and family on the loss of Mrs. Swan. Also to Dr. Edith Peterkin and her family, on the death of Mr. F. E. Peterkin, her father.

♦

Congratulations to Dr. Roberta McQueen '45, who has been awarded the Faulkner Gold Medal in Psychiatry in the U. of Toronto Diploma Course. Dr. Roberta is the daughter of Mrs. McQueen and the late Dr. J. D. McQueen.

♦

Mr. and Mrs. Malcolm Campbell announce the engagement of their daughter Ann, to Dr. John Patrick Benstead, London, Eng. The wedding will take place in St. Luke's Church, Dec. 3rd, 1949.

# Department of Health and Public Welfare

## Comparisons Communicable Diseases — Manitoba (Whites and Indians)

| DISEASES | 1949 Oct. 9 to Nov. 5,'49 | 1949 Sept. 11 to Oct. 8,'49 | 1948 Oct. 3 to Oct. 30,'48 | 1948 Sept. 5 to Oct. 2,'48 | Total Jan. 2 to Nov. 5,'49 | Total Dec. 28,'47 to Oct. 30,'48 |
|---|---|---|---|---|---|---|
| Anterior Poliomyelitis | 10 | 36 | 14 | 38 | 103 | 127 |
| Chickenpox | 141 | 21 | 198 | 94 | 1091 | 2320 |
| Diphtheria | 0 | 0 | 12 | 2 | 16 | 33 |
| Diphtheria Carriers | 0 | 1 | 6 | 1 | 4 | 10 |
| Dysentery—Amoebic | 0 | 0 | 3 | 0 | 0 | 3 |
| Dysentery—Bacillary | 9 | 4 | 1 | 0 | 21 | 12 |
| Erysipelas | 3 | 1 | 1 | 2 | 25 | 30 |
| Encephalitis | 3 | 15 | 0 | 1 | 30 | 4 |
| Influenza | 15 | 5 | 8 | 5 | 194 | 137 |
| Measles | 281 | 92 | 64 | 45 | 5343 | 671 |
| Measles—German | 5 | 2 | 0 | 0 | 105 | 34 |
| Meningococcal Meningitis | 3 | 1 | 1 | 0 | 24 | 14 |
| Mumps | 27 | 13 | 156 | 106 | 935 | 1685 |
| Ophthalmia Neonatorum | 0 | 1 | 0 | 0 | 1 | 0 |
| Pneumonia—Lobar | 12 | 5 | 7 | 3 | 155 | 136 |
| Puerperal Fever | 1 | 0 | 0 | 1 | 3 | 2 |
| Scarlet Fever | 31 | 18 | 17 | 19 | 124 | 205 |
| Septic Sore Throat | 7 | 0 | 0 | 0 | 32 | 18 |
| Smallpox | 0 | 0 | 0 | 0 | 0 | 0 |
| Tetanus | 0 | 1 | 1 | 1 | 3 | 6 |
| Trachoma | 1 | 0 | 0 | 0 | 2 | 1 |
| Tuberculosis | 88 | 116 | 1 | 63 | 976 | 1328 |
| Typhoid Fever | 3 | 1 | 0 | 1 | 11 | 9 |
| Typhoid Paratyphoid | 0 | 0 | 0 | 0 | 0 | 2 |
| Typhoid Carriers | 0 | 1 | 0 | 2 | 4 | 2 |
| Undulant Fever | 4 | 6 | 1 | 1 | 19 | 13 |
| Whooping Cough | 2 | 11 | 10 | 19 | 162 | 285 |
| Gonorrhoea | 129 | 118 | 97 | 118 | 1115 | 1134 |
| Syphilis | 21 | 33 | 34 | 32 | 311 | 379 |
| Diarrhoea and Enteritis, under 1 yr. | 44 | 43 | 10 | 12 | 242 | 157 |

**Four-Week Period, October 9 to November 5, 1949**

| DISEASES (White Cases Only) | *778,000 Manitoba | *861,000 †Saskatchewan | *3,825,000 †Ontario | *2,962,000 Minnesota |
|---|---|---|---|---|
| *Approximate population. | | | | |
| Anterior Poliomyelitis | 10 | 20 | 62 | 150 |
| Chickenpox | 141 | 166 | 598 | — |
| Diarrhoea and Enteritis | 44 | 2 | — | — |
| Diphtheria | — | 4 | 19 | 6 |
| Diphtheria Carriers | — | 1 | — | — |
| Dysentery Bacillary | 9 | — | 13 | 11 |
| Encephalitis | 3 | — | 2 | 3 |
| Erysipelas | 3 | 3 | 4 | — |
| Infectious Jaundice | — | — | 6 | — |
| Influenza | 15 | 4 | 14 | 1 |
| Measles | 281 | 408 | 244 | 88 |
| Measles, German | 5 | 9 | 46 | — |
| Meningitis Meningococcal | 3 | 1 | 5 | 4 |
| Mumps | 27 | 15 | 487 | — |
| Pneumonia Lobar | 12 | — | — | — |
| Puerperal Fever | 1 | — | — | — |
| Scarlet Fever | 31 | 8 | 115 | 62 |
| Septic Sore Throat | 7 | 1 | 4 | 2 |
| Tetanus | — | 3 | — | — |
| Trachoma | 1 | — | — | — |
| Tuberculosis | 88 | 54 | 80 | 223 |
| Typhoid Fever | 3 | — | 4 | 4 |
| Typh. Para-Typhoid | — | 10 | — | — |
| Undulant Fever | 4 | — | 4 | 22 |
| Whooping Cough | 2 | 2 | 120 | 18 |
| Gonorrhoea | 129 | — | 257 | — |
| Syphilis | 22 | — | 105 | — |

♦

**Anterior Poliomyelitis** cases should be a thing of the past for 1949. To date of writing there have been 108 cases and quite a few have been of the bulbar type.

**Diarrhoea and Enteritis** (under 1 year) has shown an increase so far this year. It is one of the most serious infections of infants.

**Encephalitis** has been more prevalent than usual—32 cases.

**Scarlet Fever**—Outbreaks of a mild type have appeared in two or three parts of the province.

**Typhoid Fever** shows a low incidence but has not disappeared as is shown by the odd sporadic case.

**Venereal Diseases** — Gonorrhoea incidence remains about the same but syphilis is still decreasing. With penicillin treatment one would expect these two diseases to be wiped out but we have not yet reached that happy occasion.

♦

### DEATHS FROM REPORTABLE DISEASES

**For Four-Week Period, September 7 to October 4, 1949**

**Urban**—Cancer, 40; Influenza, 1; Lethargic Encephalitis, 1; Pneumonia Lobar (108, 107, 109), 1; Pneumonia (other forms), 4; Poliomyelitis, 4; Tuberculosis, 10; Typhoid Fever, 1; Diarrhoea and Enteritis, 5; Hodgkin's Disease, 1. Other deaths under 1 year, 20. Other dtaths over 1 year, 167. Stillbirths, 17. Total, 204.

**Rural**—Cancer, 28; Influenza, 2; Lethargic Encephalitis, 1; Pneumonia Lobar (108, 107, 109), 2; Pneumonia (other forms), 11; Poliomyelitis, 1; Tuberculosis, 8; Whooping Cough, 1; Diarrhoea and Enteritis, 8; Tetanus, 1; Other deaths under 1 year, 14. Other deaths over 1 year, 146. Stillbirths, 9. Total, 169.

**Indians**—Influenza, 4; Pneumonia Lobar (108, 107, 109), 1; Pneumonia (other forms), 1; Tuberculosis, 4; Diarrhoea and Enteritis, 4. Other deaths under 1 year, 4. Other deaths over 1 year, 5. Total, 9.

♦

### DEATHS FROM REPORTABLE DISEASES

**For Four-Week Period, October 5 to November 1, 1949**

**Urban**—Cancer, 54; Influenza, 1; Pneumonia Lobar (108, 107, 109), 1; Pneumonia (other forms), 8; Poliomyelitis, 2; Tuberculosis, 5; Diarrhoea and Enteritis, 5. Other deaths under 1 year, 16. Other deaths over 1 year, 187. Stillbirths, 21. Total, 224.

**Rural**—Cancer, 18; Measles, 2; Pneumonia Lobar (108, 107, 109), 2; Pneumonia (other forms), 5; Tuberculosis, 13; Diarrhoea and Enteritis, 5; Bacillary Dysentery, 1. Other deaths under 1 year, 10. Other deaths over 1 year, 170. Stillbirths, 10. Total, 190.

**Indians**—Pneumonia (other forms), 1; Tuberculosis, 1; Diarrhoea and Enteritis, 6. Other deaths under 1 year, 2. Other deaths over 1 year, 7. Total, 9.

# Manitoba Medical Review

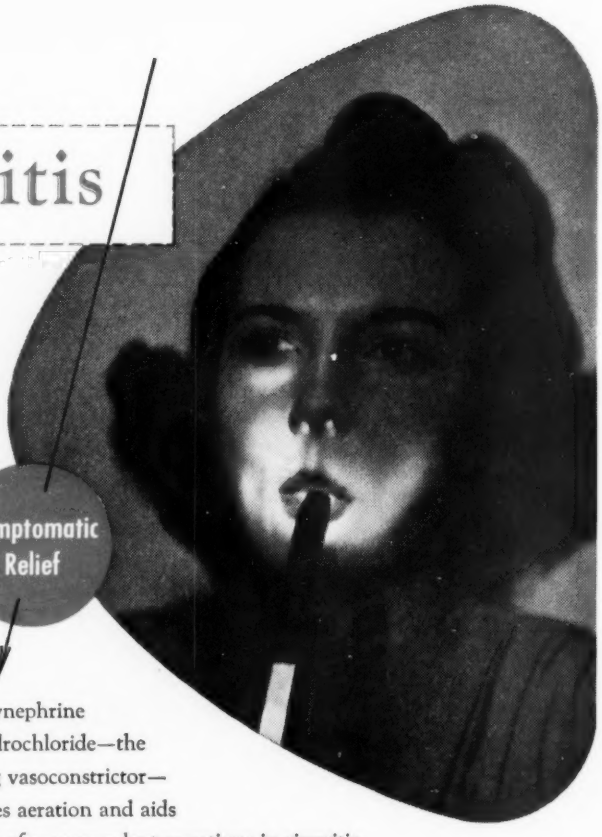
*Our Best Wishes*
*for a . . .*

Merry Christmas

*to Each*
*and Everyone . . .*

**Vol. 29** DECEMBER, 1949 **No. 12**

# sinusitis



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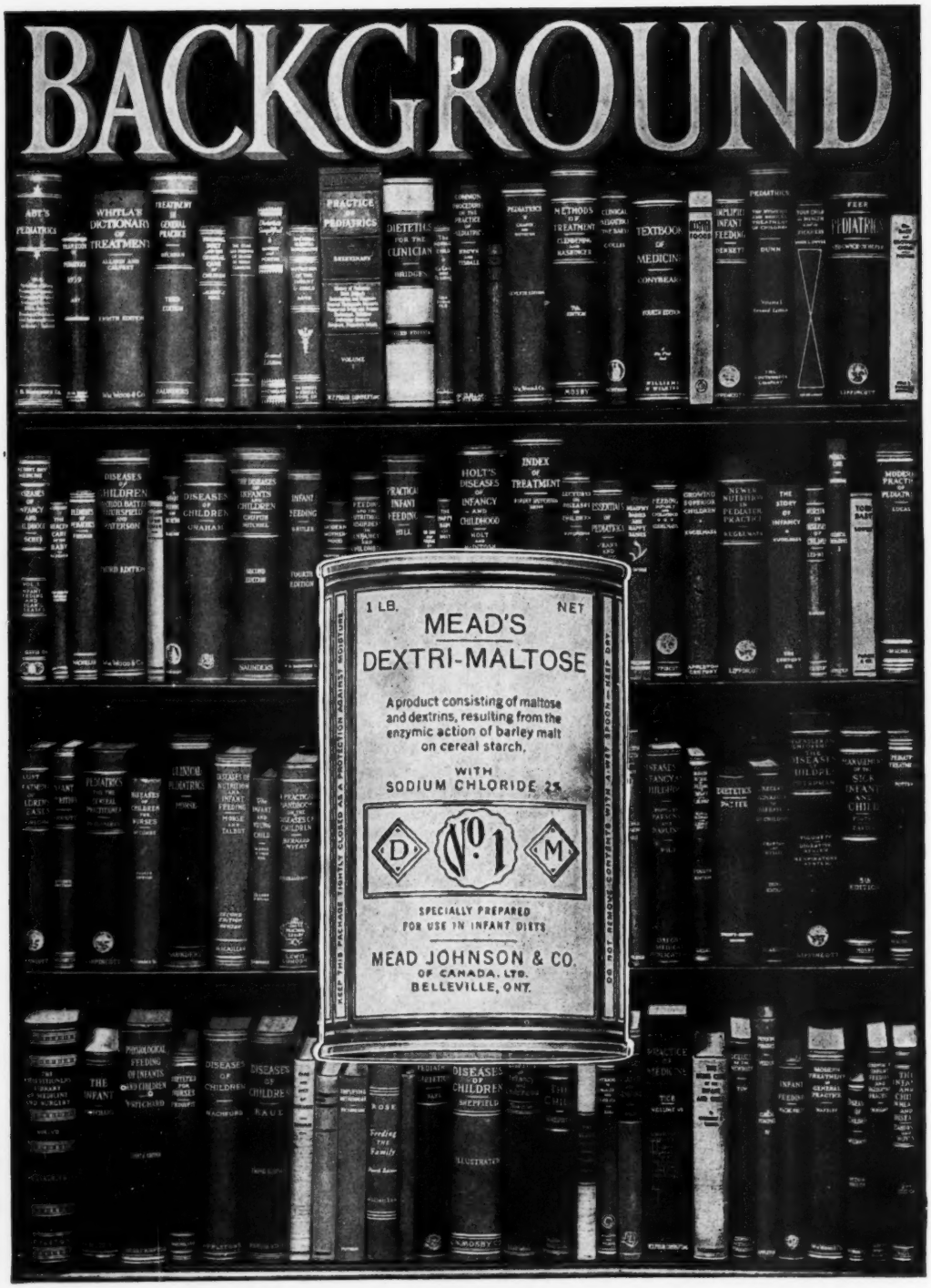
# BACKGROUND




**THE use of cow's milk, water and carbohydrate mixtures represents the one system of infant feeding that consistently, for over three decades, has received universal pediatric recognition. No carbohydrate employed in this system of infant feeding enjoys so rich and enduring a background of authoritative clinical experience as Mead's Dextri-Maltose.**